1. Most common site of brain metastasis?

a) Brainstem

b) Cerebellum

c) Cerebral cortex

d) Thalamus

Correct Answer - C
Cerebral cortex REF: Sabiston's text book of surgery 18th ed chapter 72
Metastatic Brain Tumors:
Metastatic brain tumors are the most common tumors of the brain. The distribution of metastases in the brain is directly related to the amount of blood flow to each part of the brain.

- Eighty percent of brain metastases occur in the cerebral hemispheres mainly the frontal lobes
- 15% occur in the cerebellum and 5% occur in the brainstem.
- The most common primary sites are lung (50%), breast cancer (15%-20%), unknown primary cancer (10%-15%), melanoma (10%), and colon cancer (5%).
- Metastases to the brain are multiple in more than 70% of cases, but solitary metastases do occur.
- Dural metastases may constitute as much as 9% of total CNS metastases

2. Which of the following is inherited as autosomal recessive form?

a) Sickle cell anemia

b) Hemophilia

c) Hereditary spherocytosis

d) Glucose 6-PO4 dehydrogenase deficiency

Correct Answer - A
Sickle cell anemia REF: Harrison's 17ed chapter 101

- Sickle cell anemia — AR
- Hemophilia — XLR
- Hereditary spherocytosis — AD
- G6PD deficiency — XLR

3. Anti transglutaminase antibody is seen in?

a) Celiac disease

b) SLE

c) Collagenous colitis

d) Tropical sprue

Correct Answer - A
Celiac disease REF: Harrisson 17th edition, Chap. 288 & Table 308-42 See APPENDIX-51 for "AUTOANTIBODIES"
Asymptomatic celiac disease with selective malabsorption is being found with increasing frequency; the diagnosis can be made by testing for antigliadin, antiendomysial, or transglutaminase antibodies but may require endoscopic biopsy. A trial of a gluten-free diet can be confirmatory.

4. Brown atrophy is due to accumulation of:

a) Melanin

b) Hemosiderin

c) Hematin

d) Lipofuscin

Correct Answer - D
Lipofuscin REF: Pathology by Edward F. Goljan page 7
The combination of an atrophic heart and lipofuscin accumulation is referred to as brown atrophy. Lipofuscin is a "wear and tear" pigment that commonly deposits within hepatocytes, splenocytes, and myocardial cells

5. Shock lung is characterized by ?

a) Alveolar proteinosis

b) Bronchiolitis obliterans

c) Diffuse pulmonary hemorrhage

d) Diffuse alveolar damage

Correct Answer - D
Diffuse alveolar damage *[Ref: Harrison 17th/e p. 1680-1681; Robbin's 7th/e p. 715]*
Make it clear that shock lung is a synonym for acute respiratory distress syndrome, diffuse alveolar damage acute alveolar injury and acute lung injury.
- Shock lung = ARDS = Diffuse alveolar damage = Acute alveolar injury = acute lung injury
Pahology
i) Acute stage
- The lungs are heavy firm, red and boggy and exhibit congestion, interstitial and intraalveolar edema, inflammation and fibrin deposition.
- The alveolar walls become lined with *waxy hyaline membranes* that are morphologically similar to those seen in hyaline membrane disease of neonates.
- The hyaline membrane contains *fibrin rich edema fluid* mixed with the cytoplasmic and lipid remnants of necrotic
epithelial cells.
ii) Organizing stage - In this stage *type II epithelial* cells undergo proliferation in an attempt to regenerate the alveolar lining.
iii) Resolution - Resolution is unusual

6. Feature of shock lung is

a) Diffuse alveolar damage

b) Usual interstitial pneumonitis

c) Organizing pneumonia

d) Bronchilolitis

Correct Answer - A
Diffuse alveolar damage *[Ret Harrison 17^{6}/e p. 1680-1681; Robbin's 7^{1h}/e p. 715] Repeat from May 2008*

7. Degenerated neurofilaments seen in patients with Alzheimer's disease are:

a) Hirano bodies

b) Lipofuscin granules

c) Neurofibrillary tangles

d) Amyloid plaques

Correct Answer - C
Neurofibrillary tangles

8. **The process of phagocytosis was discovered by:**

a) Virchow

b) Metchnikoff

c) Koch

d) None of the above

Correct Answer - B

In the 1880s the **Russian biologist Elie Metchnikoff** discovered the process of **phagocytosis** by observing the ingestion of rose thorns by amebocytes of starfish larvae and of bacteria by mammalian leukocytes.

Ref: Robbins 8th edition, Chapter 2.

9. Demyelination is the major feature of Multiple Sclerosis. Which of the following cells forms myelin in the central nervous system?

a) Astrocytes

b) Ependymal cells

c) Microglia

d) Oligodendrocytes

Correct Answer - D

The myelin sheath is formed by oligodendrocytes in CNS and by Schwann cells in the peripheral nervous system (PNS).

The gaps formed between myelin sheath cells along the axons are called **nodes of Ranvier.**

Since the lipid structure of myelin serves as a good insulator, the myelin sheaths increase the rate of propagation and efficacy of transmission of the impulse along the axon.

The electrical impulse jumps from one node to the next at the rate as fast as 120 m/s. This rapid type of conduction is called **saltatory conduction.** Demyelination can occur early in life as consequence of congenital metabolic disorders. Demyelination later in life can be repaired with glia, which explains the frequent exacerbations and remissions in MS. It is believed that in MS, multiple mechanisms of immune injury of myelin coexist: cytokine-mediated injury of oligodendrocytes and myelin, digestion of surface myelin antigens by macrophages, complement-mediated injury, and direct injury by CD4+ and CD8+ T cells. This type of injury causes the loss of saltatory conduction in nerve fibers. The exposed axon is susceptible to further injury, resulting in irreversible axonal damage.

Glial cells do not carry action potentials, but they have many important functions. There are several **types of glial cells: astrocytes,** which transport nutrients to neurons, hold neurons in place, digest parts of dead neurons, and regulate the composition of extracellular space, and **microglia,** which possess phagocytic function, clean up debris, and protect the brain from microorganisms.

Ependymal cells form the epithelial lining of the ventricle.

Ref: Lomen-Hoerth C., Messing R.O. (2010). Chapter 7. Nervous System Disorders. In S.J. McPhee, G.D. Hammer (Eds), Pathophysiology of Disease, 6e.

10. **Labile cells are also known as intermitotic cells because of its characteristics. All of the following are labile cells, EXCEPT:**

a) Skin

b) Hepatocytes

c) Bone marrow

d) Gut mucosa

Correct Answer - B

Labile Cells (Intermitotic Cells):

- **Labile cells** normally divide actively throughout life to replace cells that are being continually lost from the body.
- They have a short G0 (resting, or intermitotic) phase.
- Continued loss of mature cells of a given tissue is a continuous stimulus for resting cells to enter the mitotic cell cycle.
- Examples of labile cells include **basal epithelial stem cells** of all epithelial linings and **hematopoietic stem cells** in bone marrow.
- Mature differentiated cells in these particular tissues cannot divide; their numbers are maintained by division of their parent **labile cells**.

Ref: Chandrasoma P., Taylor C.R. (1998). Chapter 6. Healing & Repair. In P. Chandrasoma, C.R. Taylor (Eds), Concise Pathology, 3e.

11. **All of the following are true about blood coagulation, EXCEPT:**

a) Factor X is part of both intrinsic and extrinsic pathways

b) Extrinsic pathway is activated by contact with negatively charged surfaces

c) Intrinsic pathway can be activated in vitro

d) Calcium is required in several steps of coagulation

Correct Answer - B

Contact with negatively charged surfaces activates the Intrinsic pathway of coagulation and not the Extrinsic pathway.
Intrinsic pathway is also referred to as 'contact pathway' and factor XII is also known as contact factor for its role in the initiation of coagulation on contact with negatively charged surfaces.

Extrinsic pathway is activated by tissue factor a cellular lipoprotein exposed at sites of tissue injury
Ref: Robbins pathologic basis of disease 6th edn/page 977.

12. **α-Granules of platelet contains all of the following, EXCEPT:**

a) Fibrinogen

b) Fibronectin

c) factors V

d) ATP

Correct Answer - D

Platelets play a critical role in normal hemostasis.
Their function depends on several glycoprotein receptors, a contractile cytoskeleton, and two types of cytoplasmic granules.
α-Granules have the adhesion molecule P-selectin on their membranes and contain fibrinogen, fibronectin, factors V and VIII, platelet factor 4 (a heparin-binding chemokine), platelet-derived growth factor (PDGF), and transforming growth factor-β (TGF-β).
Dense (or δ) granules contain ADP and ATP, ionized calcium, histamine, serotonin, and epinephrine.

Ref: Robbins 8th edition Chapter 4.

13. Which among the following is the commonest site of diverticulosis in old population?

a) Ascending colon

b) Transverse colon

c) Descending colon

d) Sigmoid colon

Correct Answer - D

Diverticulosis refers to the presence of diverticula without inflammation. *The sigmoid colon is the most common site of diverticulosis.*

The majority of colonic diverticula are *false diverticula* in which the mucosa and muscularis mucosa have herniated through the colonic wall.
These diverticula occur between the taeniae coli, at points where the main blood vessels penetrate the colonic wall (presumably creating an area of relative weakness in the colonic muscle).

Ref: Bullard Dunn K.M., Rothenberger D.A. (2010). Chapter 29. Colon, Rectum, and Anus. In F.C. Brunicardi, D.K. Andersen, T.R. Billiar, D.L. Dunn, J.G. Hunter, J.B. Matthews, R.E. Pollock (Eds), *Schwartz's Principles of Surgery*, 9e.

14. **Ballooning degeneration of hepatocytes is characteristically seen in:**

a) Acute hepatitis

b) Chronic hepatitis

c) Cirrhosis

d) All of the above

Correct Answer - A

With acute hepatitis hepatocyte injury takes the form of diffuse swelling (“ballooning degeneration”), so the cytoplasm looks empty and contains only scattered eosinophilic remnants of cytoplasmic organelles.

Ref: Robbins 8th edition Chapter 18.

15. **Which of the following conditions is the most frequent cause of spontaneous abortion in the first trimester of pregnancy?**

a) Abruptio placentae

b) Chorioamnionitis

c) Chromosomal abnormalities

d) Placenta previa

Correct Answer - C

At least 10% to 15% of normally fertilized and implanted ova are lost in the first trimester of pregnancy because of spontaneous abortion. Studies using immunoassay of **human chorionic gonadotropin (hCG)** for early diagnosis of pregnancy suggest that the percentage of fertilized ova lost in the first trimester might be even higher.
The great majority of these cases are attributable to **chromosomal abnormalities.**
Chromosomal studies are not routinely performed in such cases, but they are recommended when a malformed fetus has been identified or when habitual or recurrent abortions occur.

Abruptio placentae, a complication of the third trimester, occurs when the placenta detaches prematurely from its implantation site. Retroplacental hemorrhage develops within the space between placenta and uterine wall, leading to interruption or severe reduction in the blood supply to the fetus.

Chorioamnionitis, a complication of the second and third trimesters, results from ascending infections through the vaginal canal.
Infection of chorioamniotic membranes may lead to premature rupture of membranes and abortion or premature labor.
Placenta previa is a placenta implanted in the lower segment of the uterus.
When dilatation of this segment begins in late pregnancy, a placenta previa may cause severe bleeding and lead to premature labor.

Ref: Kipps T.J. (2010). Chapter 94. Chronic Lymphocytic Leukemia and Related Diseases. In J.T. Prchal, K. Kaushansky, M.A. Lichtman, T.J. Kipps, U. Seligsohn (Eds), *Williams Hematology*, 8e.

16. **Renal angiomyolipoma is associated with:**

a) Tuberous sclerosis

b) Neurofibromatosis 1

c) Neurofibromatosis 2

d) All of the above

Correct Answer - A

Angiomyolipomas are present in 25% to 50% of patients with tuberous sclerosis, a disease caused by loss-of-function mutations in the **TSC1 or TSC2 tumor suppressor genes.**
This is a benign tumor consisting of vessels, smooth muscle, and fat.
It is characterized by lesions of the cerebral cortex that produce epilepsy and mental retardation, a variety of skin abnormalities, and unusual benign tumors at other sites, such as the heart.

Ref: Robbins 8th edition Chapter 20.

17. **FALSE statement about polyarteritis nodosa (PAN) is:**

a) It is a necrotizing vasculitis of small and medium-sized muscular arteries

b) Involvement of the renal and visceral arteries is characteristic.

c) PAN does not involve pulmonary arteries and bronchial vessels

d) Granulomas, significant eosinophilia, and are not observed.

Correct Answer - C

Polyarteritis nodosa (PAN)

- It is a multisystem, necrotizing vasculitis of small and medium-sized muscular arteries.
- Involvement of the renal and visceral arteries is characteristic.
- PAN does not involve pulmonary arteries, **although bronchial vessels may be involved;**
- Granulomas, significant eosinophilia, and an allergic diathesis are not observed.

Ref: Harrisons principles of internal medicine, 18th edition, Page: 2794.

18. **Stem cells in skin are found in all, EXCEPT:**

a) Sebaceous glands

b) Sweat glands

c) Hair follicle

d) None of the above

Correct Answer - B

Stem cells are located in three different areas of the epidermis: the hair follicle bulge, interfollicular areas of the surface epidermis, and sebaceous glands.

Ref: Robbins 8th edition Chapter 3.

19. Small vessel vasculitis are -

a) Classical PAN

b) Wegner's granulomatosis

c) Giant cell arteritis

d) All

Correct Answer - B

Ans. is `b' i.e., Wegner's granulomatosis

- Inflammation of vessel wall is called vasculitis.

o Of these systemic necrotizing vasculitis, several types affect the aorta and medium sized vessels, but most affect small vessels, such as arterioles, venules, and capillaries —> small vessel vasculitis.

Large vessel vasculitis Medium vessel vasculitis Small vessel vasculitis

o Giant cell arteritis o Polyarteritis nodosa ANACA positive ANCA negative

(Temporal arteritis) o Kawasaki disease o Wegner's granulomatosis o Bechet's syndrome

o Takayasu arteritis o Buerger's disease o Microscopic polyangitis o Hypersensitivity

o Cogan syndrome o Churg strauss syndrome o Urticarial vasculitis o Drug induced

<u>Following information have been added in Pie of Robbins</u>

o Following are *small vessels vasculitis* and are immune-complex mediated :

1. SLE 3) Cryoglobulinemia
2. *Henoch schonlein purpoura* 4) Good-pasture disease

o Following *small vessel vasculitis* are pauci-immune, i.e. there is paucity of immune complexes:

1. Microscopic polyangitis syndrome 2. Wegener granulomatosis	3. Chrug-strauss

20. Which is activated for nuclear fragmentation in apoptosis -

a) Caspases

b) Apaf - 1

c) Oxygen free radicals

d) All

Correct Answer - A
Ans is 'a' i.e., Caspases
o *Caspases* and *endonuclease* cause chromatin fragmentation in apoptosis.
o They are inactive, so first they should be activated.
o Cytochrome 'c' binds with Apaf-1 and this complex activates caspases.
o Caspases cause fragmentation of chromatin and also activate endonuclease.
About option 'b'
o Though Apaf-1 helps in activation of caspases, it has no role in chromatin framentation and It does not have two seprate forms active or inactive. It just forms complex with cytochrome 'C' to activate caspases.

21. Colonic polyp that has maximum chance of malignant

a) Hyperplastic polyp

b) Adenomatous polyp

c) Juvenile polyp

d) Polyp of Peutzeger syndrome

Correct Answer - B
Ans. is 'b' i.e., Adenomatous polyp

22. Type of inheritance in MELAS -

a) AD

b) AR

c) Mitochondrial

d) X-linked

Correct Answer - C
Ans. is 'c' i.e., Mitochondrial
o MELAS (mitochondria) encephalopathy with lactic acidosis an stroke) is a mitochondrial disease.

23. In marfan syndrome, the defect is in -

a) Fibrillin I

b) Fibrillin II

c) Collegen

d) Elastin

Correct Answer - A
Ans. is 'a' i.e., Fibrillin I
Marfan syndrome
o Marfan syndrome results from inherited defect in an extracellular glycoprotein fibrillin -1 on chromosome - 15. o It has autosomal dominant inheritance.

- Pathogenesis

Defect in fibrillin affects the elastic recoil of extracellular connective tissue.

Elastic fibres consist of a central core made up of *elastin,* surronded by a peripheral network of *microfibrils* that consists largely *fibrillin.*

Defect in fibrillin causes defective function of elastic fibres.

Microfibrils (containing fibrillin) are mainly distributed to Aorta, ligaments of joint and ciliary zolules of lens -4 So, in marfan syndrome these tissues are primarily affected.

24. Watson and Crick are associated with *?*

a) Discovery of helical structure of DNA

b) Association of Helicobacter pylori with chronic gastritis

c) Discovery of HIV virus

d) None of the above

Correct Answer - A
Ans. is 'a' i.e., Discovery of helical structure of DNA

25. Shape of RBC is biconcave due to?

a) Ankyrin

b) Spectrin

c) Band protein

d) Glycophorin-C

Correct Answer - B
Ans. is `b' i.e., Spectrin
Membrane proteins of RBC
There are following membrane proteins of RBC:
(A) Integral proteins

- These are embedded in membrane via hydrophobic interactions with lipids
- Integral proteins are:

(I) Band-3: It has two functions:

- Anionic transport: Exchange bicarbonate for chloride
- Structural: Linkage of lipid bilayer to underlying membrane skeleton and important for prevention of surface loss.

Glycophorins: Imparts a negative charge to the cell, reducing interaction with endothelium and other cells.
Aquaporin 1: These selective pores for water transport allow RBC to remian in osmotic equilibrium with ECF
(B) Peripheral membrane proteins

- These are located on cytoplasmic surface of lipid bilayer, and constitute membrane cytoskeleton.
- These are anchored via integral proteins
- These are reponsible for elastibility and maintenance of RBC shape & stability.
- Important peripheral proteins are:

- Spectrin: It is the chief protein component and is responsible for biconcave shape of RBC.
- Actin: Spectrin tail is associated with actin filament.
- Protein 4.1: Stabilises actin-spectrin interactions.
- Adducin: Stabilises actin-spectrin interactions.
- Ankyrin: *Interacts with band 3* and spectrin to achieve linkage between bilayer and skeleton. It is augmented *by protein 4.2.*

26. In contrast to iron deficiency anemia in anemia of chronic disease, TIBC -

a) Decreases

b) Increases

c) Normal

d) None

Correct Answer - A
Ans. is 'a' i.e., Decreases

Parameter	Iron deficiency	Chronic disease
• Serum iron	Decreased	Normal to decreased
• Serum ferritin	Decreased	Normal to increased
o TIBC	Increased	Decreased
o % Saturation	Decreased	**N**ormal to increased
o Bone marrow iron receptor	Decreased	Normal to increased
o Serum transferrin receptor	Increased	Decreased
• Pattern of anemia	Microcytosis preceedes Hypochromia	Hypochromia preceeds microcytosis

27. Which of the following statements is true of hereditary spherocytosis -

a) About 50% of affected infants have moderately severe neonatal jaundice

b) Diagnosis can be made in neonatal period easily by examination of a blood film

c) Intra vascular hemolysis is a common feature

d) The disorder is usually due to autosomal recessive inheritance

Correct Answer - A
Ans. is 'a' i.e., About 50% of affected infants have moderately severe neonatal jaundice

28. Diapedesis is -

a) Immigration of leucocytes through the basement membrane

b) Immigration of the leucocytes through the vessel wall to the site of inflammation

c) Aggregation of platelets at the site of bleeding

d) Auto digestion of the cells.

Correct Answer - B

Ans. is 'b' i.e., Immigration of the leucocytes through the vessel wall to the site of inflammation

- Diapedesis is the process of transmigration of leukocytes across the endothelium. The most important molecule responsible for diapedesis is called *PECAM-1 (Platelet endothelial cell adhesion molecule) or CD-31.*

29. Secondary granules in neutrophil is-

a) Lactoferrin

b) Proteolytic enzymes

c) Nucleotidase

d) Catalase

Correct Answer - A

Ans. is 'a' i.e., Lactoferrin

Neutrophils

- *Neutrophils or polymorphonuclear leukocytes* are the primary phagocytic cells involved in host resistance to bacterial infection.
- Neutrophils are the *major cells* in early phase of *acute inflammation.*
- During maturation these cells develop following *lysosomal* granules : ?

1. Primary (azeurophilic) granules

- Develops at *promyelocytic stage*
- It is *more destructive*
- Release their contents within the phagolysosomes.
- Do not secret their contents extracellularly readily and require high levels of agonists to do so.
- Contents are : ?

1. Myeloperoxidase
2. Lysozyme
3. Acid hydrolases
4. Elasases
5. Nonspecific collegenase
6. Bacterial permeability protein (BPI)
7. Defensin
8. Cathepsin G
9. Phospholipase A2.

2. Secondary (specific) granules

- Develops at myelocytic stage

- Less destructive
- Secrete their contents extracellularly more readily and by lower concentration of agonists.
- Contents are : *?*

1. *Lactoferrin* 5. Phospholipase A2 9. Gelatinase
2. Lysozyme 6. Leukocyte adhesion molecules 10. Histaminase
3. Alkaline phosphatase 7. Plasminogen activator 11. 132-miroglobulin
4. Type IV Collegenase 8. Vit B_{12} binding protein 12. Cytochrome B

3. Teriary (C-Particle) granules (From internet)

- Develops *during chemotaxis*
- Contains gelatinase and acid hydrolases

30. Major Basic Protein is formed by -

a) Lymphocyte

b) Basophil

c) Neutrophil

d) Eosinophil

Correct Answer - D
Ans. is 'd' i.e., Eosinophil
Eosinophil

- Eosinophils are the major participants in *allergic responses* and *parasitic infestation.*
- Eosinophils develop from stem cells in response to *IL-5.*
- The major chemokine for eosinophi Is is *eotaxin.*
- Eosinophils have a granule that contains *major basic protein (MBP).*
- Major basic protein has the following effect ?
  1. *Bactericidal*
  2. *Toxic to parasites*
  3. Causes degranulation of mast cells.
- Eosinophils also produce *leukotrienes, PAF, peroxidase, neurotoxin, eosinophil Cationic proteins, reactive form of 02.*
- Eosinophils also have *weak phagocytic activity* (The major phagocytic cells are neutrophils and macrophages).

31. Immediate transient type of increase vascular permeability in acute inflammation -

a) Venules

b) Capillaries

c) Arterioles

d) None

Correct Answer - A
Ans. is 'a' i.e., Venules
Formation of endothelial gaps in venules is the most common mechanism of vascular lekage

32. Endogenous chemoattractants are all except *?*

a) C5a

b) Integrins

c) LTB4

d) 11, 8

Correct Answer - B
Ans. is 'b' i.e., Integrins

33.

MHC restriction is a part of all except *?*

a) Antiviral cytotoxic T cell

b) Antibacterial helper T cell/cytotoxic cells

c) Allograft rejection

d) Autoimmune disorder

Correct Answer - D
Ans. is d i.e., Autoimmune disorder
MHC - Class I restriction
.. Graft rejection
?. Cytotoxic cell mediated cytolysis of viral infected or tumor cells.
MHC - Class II restriction
.. Graft versis host response
?. Mixed leukocyte reaction

34. Speckled pattern is seen in -

a) Anti Sm antibody

b) Anti ds DNA antibody

c) Anti histone antibody

d) Anti chromatin antibody

Correct Answer - A
Ans. is 'a' i.e., Anti Sm antibody
o **The** most **commonly used method to detect antinuclear antibodies is indirect immunofluorescence.** o The pattern of nuclear fluorescence suggests the type of antibody present in patient's serum.
o Four basic patterns are recognized **:?**
1. Homogenous or diffuse nuclear chromatin staining -----> Reflects *antihistone* and *antichromatin* antibodies.
2. **Rim or peripheral staining** *Anti ds DNA antibody.*
3. **Speckled pattern -->** Most common pattern on immunofluorescence. Reflects the presence of non DNA nuclear contents --> *anti Sm, anti - Ro, anti-La, anti SS-A, and anti SS-B antibodies.*
4. Nucleolar pattern --> Nucleolar RNA.

35. A 30 year old lady presents to the outpatient department with an Erythematous butterfly rash on her checks. Which of the following antibodies should be assayed initially for her suspected condition -

a) Anti-Ds-DNA

b) Anti-Ro-Antibody

c) Anti-Centromere-Antibody

d) Anti-mitochondria(-Antibody

Correct Answer - A
Ans. is 'a' i.e., Anti-Ds-DNA
o *Presence of an erythematous butterfly rash on the cheeks (malar rash) of this 30 year old female suggests a possible diagnosis of SLE.*
o Anti-Ds-DNA-Antibodies (and Anti-Sin-Antibodies) are the most specific antibodies for SLE.

36. Best investigation for diagnosing amyloidosis *?*

a) Rectal biopsy

b) Colonoscopy

c) CT scan

d) Upper GI endoscopy

Correct Answer - A
Ans. is 'a' i.e., Rectal biopsy
Diagnosis of amyloidosis

- *The most definitive investigation for amyloidosis is biopsy.* The diagnosis of amyloidosis is made by detecting the characteristic amyloid protein in a biopsy specimen of involved tissue.
  o For many years rectal biopsy was the first procedure of choice. However, *the capillaries in the subcutaneous fat are aften involved in patients with systemic amyloidosis and can often provide sufficient tissues for the diagnosis of amyloidosis.*
  o Therefore, a needle aspiration biopsy of fat just under the skin of the belly (fat pad aspiration) offers a simple and less invasive method to diagnose systemic amyloidosis and biopsy of the organ with the most severe clinical involvement is often unnecessary.
  o *When the subcutaneous fat aspiration biopsy does not provide information to reach a final diagnosis, biopsy samples can be collected from other organs.*
  o The best sites of biopsy are abdominal fat pad (90% sensitivity) and rectal mucosa (70-80% sensitivity). Other sites are salivary glands, gingiva, skin, tongue, bone marrow, stomach.

37. Chediak Higashi syndrome is characterised by the following except -

a) Neutrophilia

b) Defective degranulation

c) Delayed microbial killing

d) Giant granules

Correct Answer - A
Ans. is 'a' i.e., Neutrophilia

38. The most reliable investigation in amyloid disease is -

a) Rectal biopsy

b) Immunoglobulin assay

c) Ultrasound

d) Urine examination

Correct Answer - A
Ans. is 'a' i.e., Rectal biopsy

39. HMB 45 is a tumor marker for -

a) Neuroblastoma

b) Neurofibroma

c) Malignant melanoma

d) Angiosarcoma

Correct Answer - C
Ans. is 'c' i.e., Malignant melanoma
Markers for melanona
1. S-100 - 90% of tumors are positive
2. HM B-45 - More specific but less sensitive than S-100
3. TA-90

Important markers

J S-100, liMB-45
o TA-90
o NMP-22
o Neuron Specific enalase
o Chromogranin A
o Lipid associated Sialic acid (LASA-P) o CA 72-4
o CA 19-9 o CAl25
o CA 27.29 & CA 15-3

Tumor

Melanoma
Melanoma, colon & breast ca.
Urinary bladder ca.
Neuroendocrine tumors (small cell ca of lung, carcinoid tumor & neuroblastoma)
Ovarian Ca.
Ovarian, pancreatic & gastric Ca.
Pancreatic & colorectal Ca

Pancreatic & colorectal Ca
Epithelial ovarian tumor
Breast Cancer.

40. Elevated AFP levels are seen in all of the following except -

a) Hepatoblastoma

b) Seminoma

c) Teratoma

d) None of the above

Correct Answer - B
Ans. is 'b' i.e., Seminoma Ca
o It is never elevated in seminomas. Presence of alpha feto protein rules out the diagnosis of seminomas.

41. N-MYC amplification is associated with which tumor?

a) Burkitt lymphoma

b) Squamous cell carcinoma lung

c) Astrocytoma

d) Neuroblastoma

Correct Answer - D
Ans. is 'd i.e., Neuroblastoma

42. The presence of small sized platelets on the peripheral smear is characteristic of -

a) Idiopathic thrombocytopenic purpura

b) Bernard soulier syndrome

c) Disseminated intravascular coagulation

d) Wiskott Aldrich syndrome

Correct Answer - D
Ans. is 'd' i.e., Wiskott Aldrich syndrome
o Characteristics of Wiskott Aldrich syndrome
(a) Severe eczema *(b)* Thrombocytopenia *(c)* Recurrent infections
o The platelets are not only reduced in number but more characteristically are small.
o Other characteristic abnormality seen in Wiskott Aldrich syndrome is that peripheral T cells appear bald and devoid of microvilli.
<u>Bernard Soulier disease</u>
o Autosomal recessive
o Inherited deficiency of platelet membrane glycoprotein compex (Ib-IX). This glycoprotein is receptor for von vile brand factor (vWF) and is essential for normal platelet adhesion to collagen.
o Giant platelets are seen
o Platelet adhesion is decreased
o Platelet aggregation is decreased with Ristocetin but normal with collagen and ADP.
<u>Remember</u>
o In Bernard soulier disease GPIb (platelet receptor for vWF) is defective.
o While in Glanzmann's thrombasthenia GPIIIb-IIa (receptor for

fibrinogen) is absent.

43. In Von willebrand disease, there is -

a) In Von willebrand disease, there is -

b) Factor VIII C deficiency

c) Factor X deficiency

d) vWF

Correct Answer - D
Ans. is 'd' i.e., vWF
o Von willebrand disease is characterized by the deficiency of vWF, while the synthesis of factor VIIIc is normal.

44. Major source of collagen in cirrhosis -

a) Kupfer cells

b) Ito cell (Hepatic stellate cell)

c) Hepatocyte

d) Canalicular cell

Correct Answer - B
Ans. is 'b' i.e., Ito cell (Hepatic stellate cell)
o Perisinusoidal stellate cells (Ito cells) play a role in the storage and metabolism of vitamin A and are transformed into collegen producing myofibroblasts when there is inflamation of the liver. These cells are the major source of collegen in cirrhosis.

45. Clara cells are seen in -

a) Alveoli

b) Bronchus

c) Trachea

d) Bronchiole

Correct Answer - D
Ans. is 'd' i.e., Bronchioles
Clara cells are small dome shaped cells present in terminal bronchiole
o *They secrete a protein that lines the small air passages.*

46. Bronchiectasis means.....of bronchi -

a) Inflammation

b) Dilatation

c) Cavitation

d) All

Correct Answer - B
Ans. is 'b' i.e., Dilatation
Bronchiectasis

- Bronchiectasis is a disease characterized by permanant dilatation of bronchi and bronchioles caused by destruction of the muscle and elastic tissue, resulting from or associated with chronic necrotizing infections.
- Bronchiectasis is associated with ?Congenital conditions
- Cystic fibrosis

o Primary ciliary dyskinesia (Kartagener syndrome)
o Intralobar sequestration of the lung.
Post infectious necrotizing pneumonia
o Bacteria —> M. Tuberculosis, staph. aureus. H. influenzae, Pseudomonas.
o Viruses Adenovirus, HIV, influenza virus.
o Fungus --> Allergic bronchopulmonary aspergillosis.
.. Bronchial obstruction ---> Tumor, foreign body, mucus impaction.
2. Other conditions —› RA, SLE, IBD, post-transplantation.

47. Kartagener's syndrome includes -

a) Situs inversus

b) Bronchiectasis Sinusitis

c) Male infertility

d) All

Correct Answer - D
Ans. is 'a' i.e., Situs inversus; 'b' Bronchiectasis, Sinusitis' `c' Male infertility
o Kartagener's syndrome is a subgroup of primary ciliary dyskinesia.
[Ref Bobbin's r/e p. 692 & 7^{1h}/e p. 727] Primary ciliary dyskinesia ?
o It is an antosomal recessive syndrome.
o It is characterized by poorly functioning cilia. There is absence or shortening of Dynein arms that are responsible for the coordinated bending of cilia.
o Approximately half of the patients with primary ciliary dyskinesia have kartagener's syndrome.

Kartagener's syndrome

Poor functioning of cilia contribute to retention of secretions and recurrent infections

Sinusitis --> Lack of ciliary activity interferes with bacterial clearance, predisposing sinuses to infection

Situs inversus ---> Due to ineffective cell motility during embryogenesis

Infertility Due to ineffective mobility of sperm

48. True about kartagener's syndrome -

a) Dextrocardia

b) Infertility

c) Mental retardation

d) a and b

Correct Answer - D
Ans. is 'a' i.e., Dextrocardia; 'b' Infertility

49. Which of the following is characteristically *not* associated with the development of interstitial lung disease ?

a) Organic dusts

b) Inorganic dusts

c) Toxic gases e.g. chlorine, sulphur dioxide

d) Inhalation of tobacco smoke

Correct Answer - D
Ans. is 'd' i.e., Inhalation of tobacco smoke
Interstitial lung disease (ILD)
o Interstitial lung disease refers to a group of lung diseases affecting the interstitum of lung, i.e. alveolar epithelium, pulmonary capillary endothelium, basement membrane, perivascular and perilymphatic tissues.
o **ILD** is also known as **diffuse parenchymal disease.**
o In general, the clinical and pulmonary functional changes are those of restrictive lung disease.
o Chest radiographs show diffuse infiltration by *small nodules, irregular lines, or ground glass shadows, hence the term infiltrative.*
o In advanced stages, there is scarring and gross destruction of lung often referred to as *end-stage lung or honeycomb lung.*
o ILD may be classified according to the cause
1. Inhaled substances
o Inorganic ---> Silicosis, Asbestosis, Berylliosis
o Organic ---> Hypersensitivity, pneumonitis.

2. **Drug induced** **--->** Antibiotics, chemotherapeuic and antiarrhythmic agents.
3. **Connective tissue disease** **--->** SLE, RA, systemic sclerosis, Dermatomyositis.
4. **Infection** **—>** Atypical pneumonia, Pneumocystis pneumonia, Tuberculosis.
5. **Toxic gases**
6. **Idiopathic** **---->** Sarcoidosis, Idiopathic pulmonary fibrosis, Hamman - Rich syndrome.
7. **Malignancy** **--->** Lympangitic carcinomatosis.

50. All are true about postreptococcal glomerulonephritis except -

a) Crescent formation

b) Subepithelial deposits

c) Granular deposits of IgG

d) Deposition of IgA

Correct Answer - D
Ans. is 'd' i.e., Deposition of IgA
Post streptococcal (Acute proliferative) glomerulonephritis
o Post streptococcal glomerulonephritis (PSGN) is an acute proliferative glomerulonephritis which is characterized by diffuse proliferation of glomerular cells, associated with influx of leukocytes.
o PSGN is characterized by -
i) *Enlarged, hypercellular glomeruli* that is caused by
o Infiltration of leukocytes, both neutrophils and monocytes.
o Proliferation of endothelial cells and mesangial cells.
Proliferation and leukocyte infiltration is diffuse, i.e. involving all lobules of all glomeruli.
ii) In *sever form —> Crescent* formation.
iii) By *immunofluorescence microscopy,* there are granular deposits of IgG, IgM and C3 in the mesangium and along the basement membrane.
iv) The characteristic electron microscopic findings are discrete, amorphous, electron dens deposits on the epithelial side of the membrane, often having the appearance of humps —> Subepithelial humps.
v) Subendothelial, intramembranous (within GBM) and mesangial deposits may be present.

Also know
In its severe form acute diffuse proliferative GN may show rapid deterioration of renal function with formation of crescent in the glomeruli —> it is referred as *rapidly progressive glomerulonephritis.*

51. PSGN (post strept. GN) asso. with *?*

a) Subepithelial deposits

b) Nephritis along with acute Renal failure

c) Low complement levels

d) All

Correct Answer - D
Ans. 'a' i.e., Subepithelial deposits; 'b' i.e., Nephritis along with acute renal failure; `c' i.e., Low complement levels
PSGN appears 1 to 4 weeks after a streptococcal infection of pharynx or skin (impetigo).
o Occurs most frequently in children 6 to 10 years of age, but adults any age can be affected.
o The lesions are caused by immune complex deposition and activation of complement --> *Complement level decreases* (C_3 and CH_{SO} are decreased with normal C_4) --> *Complement level returns to normal in 6-8 weeks.*
o Clinically child presents with acute nephritic syndrome, i.e. hematuria, *oliguric acute renal failure,* azotemia, *proteinuria, hypertension &* edema.
Remember
PSGN causes acute renal failure, but not chronic renal failure —)
More than 95% of affected children eventually recover totally with conservative therapy.

52. Nephrotic syndrome is characterised by

a) Proteinuria

b) Hyperlipidemia

c) Oedema

d) All

Correct Answer - D
Ans. is 'a' i.e., Proteinuria; 'b' i.e., Hyperlpidemia; 'c' i.e., Oedema
Pathophvsiologv of nephrotic syndrome
Proteinuria
o The most important feature of nephrotic syndrome is massive proteinuria (>3.5 gm/day)
o Proteinuria results from altered permeability of glomerular filtration barrier for protein.
o The largest proportion of protein lost in the urine is albumin but globulins are also excreted in some diseases. The ratio of low to high molecular weight proteins in urine in various cases of syndrome is a manifestation of the selectivity of proteinuria. A *highly selective proteinuria* consists mostly of low molecular weight proteins, i.e. *albumin & transferrin,* where as *apoorly selective proteinuria* consists of higher molecular weight *globulin* in addition to albumin.
Edema
o Proteinuria leads to *hypoalbuminemia* that results in decreased colloid osmotic pressure edema. Hyperlipidemia
o Increased synthesis of lipoproteins by liver.
o Decreased catabolism of lipids.
o There is increased cholesterol, triglycerides VLDL, and LDL.
Lipiduria
o Hyperlipidemia results in lipiduria due to excessive leakiness of glomerular filtration barrier

glomerular filtration barrier.

53. Microscopic picture of seminoma Testis -

a) Sheets of lymphocytes in homogenous background

b) Glandular with papilary outgrowth

c) Dermoid elements

d) Hyperchromatic nuclei in eosinophilic cytoplasm

Correct Answer - A
Ans. is 'a' i.e., Sheets of lymphocytes in homogenous background

54. Marker for seminoma testis is -

a) Alfa - fetoprotein

b) Carcinoembryonic antegens

c) HCG

d) Acid phosphatase

Correct Answer - C
Ans. is 'c' i.e., HCG
Normally seminoma cells do not contain AFP and HCG.

- *"Approximately 15% of seminomas contains syncytiotrophoblasts which secret HCG" Robbin's 1042*
- Seminoma is positive for placental alkaline phosphatase and keratin.

55. Which is not a risk factor of endometrial carcinoma -

a) Obesity

b) Smoking

c) Infertility

d) Tamoxifen

Correct Answer - B
Ans. is 'b' i.e., Smoking
Endometrial carcinoma
o Endometrial carcinoma is *the most common invasive cancer of the female genital tract* and accounts for 7% of all invasive cancer in women.
o The peak incidence is in the *55- to 65-year-old woman.*
o Clinicopathological studies & molecular analysis support its classification into two major broad categories.
Type-I Carcinoma
o *Most common* type.
o Majority are *well differentiated &* mimic proliferative endometetrial glands.
o They are associated with- *obesity, diabetes, hypertension, infertility and unopposed estrogen stimulation.* Tamoxifen also increases the risk of endometrial cancer.
o *Endometrial hyperplasia is a precursor* to endometroid carcinoma.
o Mutation in *PTEN tumor* suppressor gene have been seen in 30-80% of endometeriod carcinoma & 20% patients with endometrial hyperplasia.
o Additional molecular changes that are common are microsatellite instability & mutations in KRAS & beta catenin oncogenes.

Type-H Carcinoma
o These occur in women a decade later than type I carcinoma.
o These usually arise in setting of *endometrial atropy.*
o They *are poorly differentiated.* The most common subtype is serous carcinoma, clear cell type & malignant mixed mullerian tumor.
o The most frequent alteration described is mutation *in p53 tumor suppressor gene.*

56. Most common ovarian tumor -

a) Serous cystadenoma

b) Choriocarcinoma

c) Teratoma

d) Fibroma

Correct Answer - A
Ans. is 'a' i.e., Serous cystadenoma
Ovarian tumors

Surface epithelial tumors

- Serous tumor
o Mucinous tumor o Endometrial tumor o Clear cell tumor **o** Brenner tumor
o Cysadenofibroma
Germ cell tumors
o Teratoma
o Dysgerminoma
o Endodermal sinus tumor o Choriocarcinoma
Sex cord stromal tumors
o Fibroma
- Granulosa-theca cell tumor
- Sertoli-leydig cell tumor
o *Most ovarian tumors (65-70%) are surface epithelial tumors.*
o Serous cystadenoma being the most common.

57. Most common carcinoma of breast is -

a) Intra-ductal carcinoma

b) Colloid carcinoma

c) Lobular carcinoma

d) Sarcoma phylloides

Correct Answer - A
Ans. is 'a' i.e., Intraductal carcinoma
Distribution of invasive (infiltrating)) carcinoma of breast:?
Invasive ductal carcinoma —> 79%
Mucinous (Colloid)) Carcinoma --> 2%
Lobular carcinoma 10%
Papillary carcinoma --> 2%
Tubular /cribrifrorm - —> 6%
Metaplastic carcinoma —3 <1%

58. True about histology in infilterating lobular breast carcinoma-

a) Single file pattern

b) Pleomorphic cells in sheets

c) Cribriform pattern

d) Pin wheel pattern

Correct Answer - A
Ans. is 'a' i.e., Single file pattern
o Histological hallmark of invasive lobular breast carcinoma is pattern of single infilterating tumor cells often only one cell in width or in loose clusters or sheets.

59. Women carrying BRCA 1 gene are more likely to develop which type of breast carcinoma -

a) Medullary

b) Lobular

c) Colloid

d) Secretory

Correct Answer - A
Ans. is 'a' i.e., Medullary
"Medullary carcinomas and mutinous carcinomas histological types are more commonly found in BRCA 1 carrier".

60. Paget's disease involves which of the following bone-

a) Pelvis

b) Vertebrae

c) Skull

d) All

Correct Answer - D
Ans. is 'a' i.e., Pelvis; 'b' i.e., Vertebrae & 'c' i.e., Skull
Paget disease involves

o Skull	o Spine (vertebrae)	o Tibia
o Pelvis	o Femur	o Humerus

61. Myasthenia gravis is associated with -

a) Thymoma

b) Thymic carcinoma

c) Thymic hyperplasia

d) Lymphoma

Correct Answer - A
Ans. is 'a' i.e., Thymoma
Myasthenia gravis
o It is a muscle disease caused by *immune-mediated loss of acetylcholine receptors.*
o When arising *before age 40 years, it is most commonly seen in women, but there is equal occurrence between the sexes in older patients.*

- *Thymic hyperplasia is found in 65% and thymoma in 15% of patients.*

o Analysis of neuromuscular transmission in myasthenia gravis shows a decrease in the number of muscle acetylcholine receptors (AChRs), and circulating antibodies to the AChR are present in nearly all patients with myasthenia gravis.
o Patients show improvement in strength in response to administration of anticholinesterase agents. This remains a most useful test on clinical examination.
o *Respiratory compromise* was a major cause of mortality in the past

62. Tadpole cells comma shaped cells on histopathology are seen in -

a) Trichoepithelioma

b) Spideroma

c) Rhabdomyosarcoma

d) Histiocytoma

Correct Answer - C
Ans. is 'c' i.e., Rhabdomyosarcoma
Histology of rhabdomvosarcoma
o The diagnostic cell of rhabdomyosarcoma is rhabdomyoblast.
o Rhabdomyoblast contains eccentric eosinophilic granular cytoplasm rich in thick and thin filaments. o The rhabdomyoblasts may be ?
i) Round
Elongated Tadpole or Strap cells.
o It has three variants
i) Embryonal
Alveolar
iii) Pleomorphic
o Rhabdomyoblasts are positive for *desmin, MYOD1* and *Myogenin*.

63. Onion bulb appearance on nerve biopsy is seen in -

a) Amyloid neuropathy

b) Diabetic neuropathy

c) CIDP

d) Leprous neuritis

Correct Answer - C
Ans. is 'c' i.e., Chronic inflammatory demyelinating polyneuropathy (CIDP)
Chronic inflammatory demvelinatina polyneuropathv (CIDP)

- Chronic inflammatory demyelinating polyneuropathy (CIDP, also known as chronic inflammatory demyelinating polyradiculoneuropathy) is an acquired disorder of peripheral nerves and nerve roots.

o Although the cause of CIDP and its variants is unknown, there is evidence to support the hypothesis that the disorder are immunologically based and have multiple triggers.
o The characteristic pathologic features of CIDP include segmental demyelination and remyelination, and "onion bulb" formation.

The term "onion- bulb formation" refers to the appearance of affected nerves when viewed under the microscope in transverse section.

As a result of repeated episodes of demyelination and remyelination, such nerves are enlarged due to whorls of overlapping and proliferating Schwann cell processes encircling bare axons. Some degree of axonal degeneration is usually present as well.
Clinical manifestations

o The classic form of CIDP is fairly symmetric and motor involvement is greater than sensory.
o Weakness is present in both proximal and distal muscles, and this pattern is a hallmark of acquired demyelinating polyneuropathy.

- *Cranial nerve and bulbar involvement occur in 10 to 20 percent of patients.*

o Most patients with CIDP also have sensory involvement and globally diminished or absent reflexes.
o Constipation and urinary retention are usually early symptoms of CIDP, but may occur in more severe cases.
o Most patients with CIDP exhibit a slowly progressive course, but a relapsing-remmiting course is noted in at least one-third, and may be more common in younger patients.
Electrophysiology
o *Peripheral nerve demyelination underlies the characteristic electrophysiologic features of CIDP, which are as follows :-*
LI Partial conduction block
Conduction velocity slowing
Prolonged distal motor latencies

- Delay or disappearance of F waves

o Dispersion and distance dependent reduction of compound motor action potential (CMAP) amplitude.

64. Which of the following gene defect is associated with development of medullary carcinoma of thyroid?

a) RET Proto Oncogene

b) Fap gene

c) Rb gene

d) BRCA 1 gene

Correct Answer - A
Ans. is 'a' i.e., RET proto oncogene
Thyroid carcinoma
o The major types of carcinoma and their relative frequency :?
Papillary cacinoma—> 75% to 85% (most common)
Medullary carcinoma —> 5%
Follicular carcinoma —> 10% to 2%
Anaplastic carcinoma —> <5%
o Most thyroid cacinomas are derived from the follicular epithelium , except for medullary carcinoma which is derived from the parafallicular or 'C' cells .
o Genetic factors in different thyroid carcinoma
o Papillary —> o Tyrosine kinase receptors RET or NTRK1
o RAS mutation
o BRAF oncogene
o Follicular —> o RAS oncogene (NRAS, HRAS and KRAS)
o PAX8- PPARr 1 thanslocation
o Medullary —> o RET protooncogne.

o Familial medullary cancers account for most inherited cases of thyroid cancer.
o Familial nonmedullary thyroid cancers (papillary and follicular) are very rare

65. Following are the examples of apoptosis except:
September 2008

a) Graft versus host disease

b) Menstrual cycle

c) Pathological atrophy following duct obstruction

d) Tumour necrosis

Correct Answer - D
Ans. D: Tumour necrosis

66. Metastatic calcification is seen in:
September 2009

a) Cysts

b) Atheroma

c) Normal tissues

d) Infarcts

Correct Answer - C
Ans. C: Normal tissues

67. Extracellular hyaline change is seen in: *September 2009*

a) Arteriosclerosis

b) Chronic glomerulonephritis

c) Leiomyoma

d) Alcoholic hyaline

Correct Answer - A
Ans. A: Arteriosclerosis
Hyaline change is any alteration within cells or in the extracellular spaces or structures that gives a homogeneous, glassy pink appearance in tissue sections stained with hematoxylin and eosin
Extracellular hyaline change:
- Hyaline arteriolosclerosis
- Atherosclerosis
- Damaged glomeruli.

Intracellular hyaline change:
Intracellular hyaline change is seen in renal tubular epithelium in proteinuria.
- Russell bodies in plasma cells.

Viral inclusions in the cytoplasm or in the nucleus.
- Alcoholic hyaline.

68. Reactionary hemorrhage occur within:

a) 24 hours

b) 1-2 days

c) 2-4 days

d) 4-6 days

Correct Answer - A
Hemorrhage according to the Time of appearance can be classified as belows
Primary hemorrhage

- Is one which occur at the time of injury or operation.

Reactionary hemorrhage

- In majority of cases reactionary occur within 4 to 6 hours. Such bleeding may also occur due to:
  - Restlessness
  - Coughing
  - Vomiting with raises the venous pressure

Secondary hemorrhage

- This occurs usually after 7 to 14 days of injury or operation.
- This is usually due to infection and sloughing of a part of the arterial wall.

69. Lardaceous spleen is a feature of:
March 2010

a) Thalassemia

b) Amyloidosis

c) Sickle cell anemia

d) Malaria

Correct Answer - B

Ans. B: Amyloidosis

Spleen is more frequently the seat of amyloidos is than any other organ, and that it appears in a majority of cases to be the organ primarily affected.

There are two forms of amyloid disease, called respectively the Sago form and the diffuse form or waxy spleen, to which a third or combined form may be added.

In the first the Malpighian bodies are mainly engaged; in the second the pulp.

On section of the spleen of sago type, instead of the normal small Malpighian bodies, transparent glancing areas which have been very aptly compared to grains of boiled sago. These are dotted over the surface in great profusion. On applying a solution of iodine the affected areas stand out as brown spots, which become of a deeper colour on adding dilute sulphuric acid.

The diffuse amyloid spleen presents much greater enlargement than the sago form. It is in the highest degree hard, heavy, and the edges rounded.

On section The tissue seems homogeneous and inelastic, and of a dark translucent appearance, which has been compared to that of wax or bacon, hence the names Waxy and **Lardaceous spleen.**

"Kidney is the MC involved organ in amyloidosis".

70. All of the following are true regarding Guillain-Barre syndrome except: *March 2008*

a) Peripheral nervous system is affected

b) Histologically there is inflammation of peripheral nerv

c) Descending paralysis

d) Elevated CSF proteins

Correct Answer - C
Ans. C: Descending paralysis
Guillain-Barre syndrome, a disease of the peripheral nervous system, is characterized by weakness beginning in the distal limbs but rapidly advancing to affect proximal muscle function **("ascending paralysis"), and histologically by inflammation** and demyelination of spinal nerve roots and peripheral nerves (radiculoneuropathy).
There is elevation of the CSF protein due to inflammation and altered permeability of the microcirculation within the spinal roots as they traverse the subarachnoid space.
Inflammatory cells are contained within the roots, however, and there is little to no CSF pleocytosis.

71. All of the following are true regarding marantic endocarditis except: *March 2008*

a) Vegetation may embolize

b) Vegetations along the line of closure of leaflets

c) Affects damaged valves

d) May be associated with hypercoagulable states

Correct Answer - C
Ans. C: Affects damaged valves
Nonbacterial thrombic endocarditis (NBTE)/marantic endocarditis is most commonly found on previously undamaged valves.
As opposed to infective endocarditis, the vegetations in NBTE are small, sterile, and tend to aggregate along the edges/ line of closure of the valve or the cusps.
Also unlike infective endocarditis, NBTE does not cause an inflammation response from the body.
NBTE usually occurs during a hypercoagulable state such as system wide bacterial infection, or pregnancy, though mucinous adenocarcinoma where Trousseau syndrome can be encountered. it is also sometimes seen in patients with venous catheters. NBTE may also occur in patients with cancers, particularly Typically NBTE does not cause many problems on its own, but parts of the vegetations may break off and embolize to the heart or brain, or they may serve as a focus where bacteria can lodge, thus causing infective endocarditis.

72. Pheochromocytoma is usually associated with:

September 2007

a) Pancreatic exocrine carcinoma

b) Astrocytoma

c) Neurofibromatosis

d) Neuroblastoma

Correct Answer - C
Ans. C: Neurofibromatosis
Pheochromocytoma linked to MEN II cart be caused by RET oncogene mutations. Both syndromes are characterized by pheochromocytoma as well as thyroid cancer (thyroid medullary carcinoma). MEN IIA also presents with hyperparathyroidism, while MEN IIB also presents with mucosal neuroma.
Pheochromocytoma is also associated with neurofibromatosis

73. All the following polyps are premalignant except:
March 2011

a) Juvenile polyposis syndrome

b) Familial polyposis syndrome

c) Hyperplastic polyps

d) Peutz Jegher syndrome

Correct Answer - C

Ans. C: Hyperplastic polyps

It is now appreciated that hyperplastic polyps are without malignant potential

Juvenile polyps that are single and have been completely excised carry no significant increased risk of malignancy. Multiple juvenile polyps can be a sign of the familial juvenile polyposis syndrome. This has a significant risk (approximately 10 per cent) of subsequent colon cancer and also a possible increased risk of cancers of the stomach and duodenum (first part of the small intestine).

Juvenile polyposis (JP)

- Autosomal dominant.
- Multiple hamartomatous polyps of the colorectum (98%), stomach (13%), small bowel (6%)
- Juvenile polyps are usually pedunculated, smooth, lobulated with a vulnerable surface.
- Diagnostic criteria:
  - 5 or more juvenile polyps in the colon or rectum; OR
  - One juvenile polyp and positive family history of JP; OR
  - Juvenile polyps outside the colon or rectum, i.e. stomach/small bowel

bowel.
Family history positive in 20-50%, suggesting high incidence of spontaneous mutations or low penetrance.
Children/ adolescents often presents with iron deficiency anemia, hypoproteinemia and retarded growth. Also rectal prolapse or other congenital abnormalities (15%) in CVS, Urogenital tract and CNS.
Cancer risk:
- Increased risk, lifetime risk of 20-60% for colorectal cancer.
- Median age at diagnosis is 35-40 years.
- Increased risk for gastric and duodenal cancers

- Genetic testing
  – Germline mutations of the SMAD4 and BMPR1A are detected in 11-25% and 18-30% of patients of JPC.
  – Gastric polyposis seems to be more frequent and severe in patients with SMAD4 mutations.
- Treatment
  – Colectomy and gastric surgery in severe polyposis.

Familial adenomatous polyposis (FAP)

- Autosomal dominant inherited disease, > 100 colorectal adenomas, caused by germline mutations of the tumor suppressor gene APC (detectable in 80-90% of patients with typical FAP) Prevalence 1:10000 with penetrance close to 100%.
- 25% of patients with FAP do not have positive family history. These are de novo germline mutations.
- Polyp development starts in distal colorectum at an average age of 15
- Majority of patients become symptomatic with bloody diarrhea by the age of 25
- Extracolonic manifestation:
  – Up to 90% of patients with FAP develop polyps in upper GIT
  – 30-40% gastric fundic gland polyposis and 5-10% gastric adenomas
  – Risk for gastric cancer not increased.
- Major causes of death in colectomized FAP patients are duodenal and ampullary cancer.
- Spigelman classification for polyposis in upper GIT to allow adequate follow up.
- Extra-intestinal manifestation of FAP include:

- Desmoid tumours (10-20%)
- Epidermoid cysts (30-50%)
- Fibromas
- Osteomas (often in the mandibula)

Congenital hypertrophy of the retinal pigment epithelium (70%)
- Dental abnormalities. Gardner's syndrome:

– Polyposis, epidermoid cysts, osteoma

Turcot's syndrome in FAP

– Polyposis, CNS tumours (medulloblastoma)

Increased risk observed for:

– Hepatoblastoma, follicular thyroid cancer, brain tumours (usually medulloblastoma).

- Treatment:

  – Procedure: Proctocolectomy with ileal-pouch-anal anastomosis (IPAA): Gold standard.

Peutz Jeghers syndrome (PJS)

- Autosomal dominant.
- Special type of hamartomatous GI polyp (PJ polyp) and mucocutaneous melanin pigmentations.
- PJ polyps occur throughout alimentary tract with predilection for the small bowel.
- Mostly jejunal. Esophagus is spared. Rarely nose, gallbladder and ureter.
- Polyps characterized by extensive smooth muscle aborization throughout polyp.
- Pigment lesions in 95% of patients but may disappear with age. Mostly lips, peri-oral and intra-oral mucosa.
- Diagnostic criteria:

  2 or more PJ polyps

  - One PJ polyp and mucocutaneous pigment lesion
  - One PJ polyp and positive family history of PJS.

  Endoscopic or surgical excision of large or symptomatic polyps is recommended.
- Family history is negative in up to 45% of index cases indicating de novo germline mutations.
- Recurrent colicky abdominal pain due to intussusception in adolescence or young adulthood. Also occult bleeding with iron-

deficiency anemia. Pigmentation not always present in childhood and may fade later in life.

- Intra-epithelial neoplasia predisposes to cancer - hamartoma-adenoma-carcinoma sequence
- Cancer risk:
  - 85% by age 70 years
  - 57% GI cancer.
  - Colorectal *cancer* most common with lifetime risk of 39%. Lifetime pancreatic cancer risk is 11%.
- Extraintestinal cancers include breast risk (31-50%), endometrium and ovary.
- Cancer uncommon before age 30 years.
- Almost all female patients with PJS develop potentially malignant ovarian tumour, the sex cord tumour with annular tubules (SCTAT). Malignant transformation in 20% of all cases. Sertoli cell tumours considered as male equivalent of SCTAT with gynaecomastia.
- Genetic testing
  – PJS is caused by germline mutation of the STKII tumour suppressor gene.

74. In acute myeloid leukemia, Auer rods are numerous in:
September 2009

a) M2

b) M3

c) M4

d) M5

Correct Answer - B
Ans. B: M3
The diagnosis of AML is based on the presence of at least 20% myeloid blasts in the bone marrow. Myeloblast have delicate nuclear chromatin, two to four nucleoli, and more voluminous cytoplasm than lymphoblasts.
The cytoplasm often contains fine, peroxidase-positive azurophilic granules.
Auer rods, distinctive needle like azurophilic granules, are present in many cases; they are particularly numerous in AML with the t(15;17) (acute promyelocytic leukaemia-M3).

75. ***Disseminated intravascular coagulation in cases of abortion is most commonly associated with:***
September 2007

a) Prolonged pregnancy

b) Fat embolism

c) Amniotic fluid embolism

d) All of the above

Correct Answer - C
Ans. C: Amniotic fluid embolism
Disseminated intravascular coagulation (DIC) is a complex systemic thrombohemorrhagic disorder involving the generation of intravascular fibrin and the consumption of procoagulants and platelets. The resultant clinical condition is characterized by intravascular coagulation and hemorrhage. Conditions associated with disseminated intravascular coagulation

- Sepsis/severe infection
- Trauma (neurotrauma)
- Organ destruction
- Malignancy (solid and mveloproliferative malignancies)
- Severe transfusion reactions
- Rheumatologic illness-Adult Stills disease, Lupus
- Obstetric complications- Amniotic fluid embolism, abruption placentae, hemolysis, elevated liver enzymes, low platelets (HELLP) syndrome/ eclampsia, Retained dead fetus syndrome
- Vascular abnormalities-Large vascular aneurysms
- Severe hepatic failure

- Severe toxic reactions-Envenomation, Transplant rejection, transfusion reactions

76. Hypersegmented neutrophils are a feature of:
***September 2011, March* 2013**

a) Hemosiderosis

b) Sideroblastic anemia

c) Megaloblastic anemia

d) Thalassemia

Correct Answer - C
Ans. C: Megaloblastic anemia
The diagnosis of vitamin B_{12} deficiency anemia is based on leucopenia with hypersegmented granulocytes, a moderate to severe Megaloblastic anemia, elevated levels of homocysteine and methylmalonic acid in the serum and low serum vitamin B12.
Hypersegmented neutrophil

- Normally, the number of segments in the nucleus of a neutrophil increases as it matures and ages, after being released into the blood from the bone marrow.
- Whereas normal neutrophils only contain three or four nuclear lobes (the "segments"), hypersegmented neutrophils contain five or more lobes.
- Hypersegmented neutrophils have classically been thought to be pathognomonic of the megaloblastic anemias (anemias caused by failure of bone marrow blood-forming cells to make DNA, often caused by vitamin B12 or folate deficiencies, or DNA-replication poisons).
- One of the earliest, notable changes in the peripheral blood in *megaloblastic processes* is the appearance of hypersegmented

neutrophils.

- Because of the short life-span of neutrophils, these abnormal hypersegmented neutrophils characteristically appear even before the onset of anemia in megaloblastic processes.
- Such neutrophils are less often seen in the other classes of anemia, which together are far more common than megaloblastic types of anemia.
- Note that pernicious anemia is a type of megaloblastic anemia, and as such, is expected to show hypersegmented neutrophils.

77. All are true for nephrotic syndrome except:
March 2012

a) Edema

b) Massive proteinuria

c) Hyperlipidemia

d) Hypertension

Correct Answer - D
Ans: D i.e. Hypertension
The nephrotic syndrome, also due to glomerular disease, is characterized by heavy proteinuria (more than 3.5 gm/ day), hypoalbuminemia, sever edema, hyperlipidemia, and lipiduria (lipid in the urine)

- Nephritic syndrome is due to glomerular disease and is dominated by the acute onset of usually grossly visible hematuria (RBC in urine), mild to moderate proteinuria, and hypertension; it is the classic presentation of the post-streptococcal glomerulonephritis

78. Most common type of emphysema is: *March* 2013

a) Centriacinar

b) Panacinar

c) Paraseptal

d) Irregular

Correct Answer - A
Ans. A i.e. Centriacinar
Emphysema

- It is COPD.
- It is defined pathologically as an abnormal permanent enlargement of air spaces distal to the terminal bronchioles, accompanied by the destruction of alveolar walls and without obvious fibrosis.
- It frequently occurs in association with chronic bronchitis.
- Patients have been classified as having COPD with either emphysema or chronic bronchitis predominance.
- The 3 described morphological types of emphysema are centriacinar, panacinar, and paraseptal.
  Centriacinar emphysema begins in the respiratory bronchioles and spreads peripherally.
  Also termed centrilobular emphysema, this form is associated with long-standing cigarette smoking and predominantly involves the upper half of the lungs.
  - Panacinar emphysema destroys the entire alveolus uniformly and is predominant in the lower half of the lungs.
- Panacinar emphysema generally is observed in patients with homozygous alfal antitrypsin deficiency.
- In people who smoke, focal panacinar emphysema at the lung bases

may accompany centriacinar emphysema.
- Paraseptal emphysema, also known as distal acinar emphysema, preferentially involves the distal airway structures, alveolar ducts, and alveolar sacs.

- The process is localized around the septae of the lungs or pleura.
- Although airflow frequently is preserved, the apical bullae may lead to spontaneous pneumothorax.
- Giant bullae occasionally cause severe compression of adjacent lung tissue.

79. Most common type of lung carcinoma in non smokers is:
March 2005 and September 2011

a) Small cell carcinoma

b) Adenocarcinoma

c) Squamous cell carcinoma

d) Large cell carcinoma

Correct Answer - B

Ans. B: Adenocarcinoma

Common types of lung cancer classification (e.g., based on histopathologic factors) include the following:

- Small cell carcinoma (also called oat cell carcinoma; lung cancer composed of anaplastic (unspecialized, undifferentiated) small cells)
- Squamous cell carcinoma (cancer of the layered, squamous epithelium (surface cells) of the lungs or bronchi)
- Adenocarcinoma (cancer of the glandular tissue, or cancer in which the tumor cells form recognizable glandular patterns)
- Large cell carcinoma (lung cancer composed of large-sized cells that are anaplastic in nature and often arise in the bronchi)
- Broncho-alveolar carcinoma
- Mixed and undifferentiated pulmonary carcinomas

Adenocarcinoma of the lung is currently the most common type of lung cancer in lifelong non-smokers. Adenocarcinomas account for approximately 40% of lung cancers.

This cancer is more often seen peripherally in the lungs than are small cell lung cancer and squamous cell lung cancer, both of which tend to be more often centrally located.

80. Most common feature of sarcoidosis on chest X-ray is:
March 2011, March 2013

a) Pleural effusion

b) Cavitation

c) Bilateral hilar lymphadenopathy

d) Pneumothorax

Correct Answer - C

Ans. C: Bilateral hilar lymphadenopathy

Sarcoidosis may be discovered unexpectedly on routine chest films as bilateral hilar lymphadenopathy

Sarcoidosis/Sarcoid/Besnier-Boeck disease/Besnier-Boeck-Schaumann disease

- It is a disease in which abnormal collections of chronic inflammatory cells (granulomas) form as nodules in multiple organs.
- The combination of erythema nodosum, bilateral hilar lymphadenopathy and arthralgia is called Lofgren syndrome.
- This syndrome has a relatively good prognosis
- Chest X-ray changes are divided into four stages
  - Stage 1: Bihilar lymphadenopathy
  - Stage 2: Bihilar lymphadenopathy and reticulonodular infiltrates
  - Stage 3: Bilateral pulmonary infiltrates
  - Stage 4: Fibrocystic sarcoidosis typically with upward hilar retraction, cystic and bullous changes

81. True about NK cells are all of the following except:
March 2005

a) Mediates type IV hypersensitivity

b) Kill viruses

c) They are large granular lymphocytes

d) Releases small cytoplasmic granules of proteins called perforin and granzyme

Correct Answer - A
Ans. A: Mediates type IV hypersensitivity
NK cells are a type of cytotoxic lymphocyte that constitute a major component of the innate immune system. NK cells play a major role in the rejection of tumors and cells infected by viruses.
They kill cells by releasing small cytoplasmic granules of proteins called perforin and granzyme that cause the target cell to die by apoptosis.
NK cells are defined as large granular lymphocytes (LGL) and constitute the third kind of cells differentiated from the common lymphoid progenitor generating B and T lymphocytes.
They do not express T-cell antigen receptors (TCR) or Pan T marker CD3 or surface immunoglobulins (Ig) B cell receptors but they usually express the surface markers CD16 and CD56 in humans.
Up to 80% of NK cells also express CD8.
They were named "natural killers" because of the initial notion that they do not require activation in order to kill cells that are missing "self" markers of major histocompatibility complex (MHC) class I.
Type IV (cell mediated immunity) is mediated by T-cells.

82. Karyotype in Klinefelter's syndrome is?

a) 47XXY

b) 45XO

c) 46XXY

d) 45XXX

Correct Answer - A
Ans. is 'a' i.e., 47XXY
<u>Klinefelter syndrome</u> :?

- Klinefelter syndrome is the most common chromosomal disorder associated with *male hypogonadism and infertility.*
- It is defined classically by a 47, XXY karyotype with variants demonstrating additional X and Y chromosomes. (Other variants can have 48 XXXY, rarely 49 XXXXY or mosaics can be there with some cells containing normal 46, XY and others 47, XXY). Classically, it results from meiotic non-dysjunction of sex chromosomes (40% during spermatogenesis and 60% during oogenesis). Mostly, non-dysjunction occur during 1" meiotic division.
- The patient has male phenotype with feminizing features due to extra X-chromosome (note : presence of one Y chromosome is sufficient for male phenotype. Thus XY, XXY, XXXY all are males). Extra inactive chromosome appears as Barr body.
- Important clinical features include microorchidism with normal external genitalia, *mental retardation,* gynecomastia, lack of secondary sexual characteristics with eunuchoid body habits, disproportionately long arms and legs, *hypogonadism,* increased incidence of tumors (breast carcinoma, germ cell tumors), increased incidence of autoimmune disorders (e.g. SLE), and cardiac problems *(most common is mitral valve prolapse).* Testosterone levels are

decreased, *whereas levels of gonadotropins (FSH/LH) are elevated.*

83. In Peibaldism ?

a) Inheritance pattern is autosomal dominant

b) Mutations of the KIT ligand, stem cell factor (SCF)

c) Is associated with deafness

d) Is characterized by excess melanocytes in the affected area

Correct Answer - A

Ans. is 'a' i.e., Inheritance pattern is autosomal dominant

Piebaldism

- Hypopigmentation disorder
- Caused by absence of melanocytes in the affected area.
- Autosomal dominant inheritance.
- There is a defect in the KIT proto - oncogene that codes for the KIT receptor. Thus defect in melanocyte survival results in hypopigmentation.
- *KIT receptor activation by KIT ligand/ Stem Cell Factor (SCF) results in phosphorylation and potentiation of MITE Potentiation of MITF activity is responsible for melanocyte survival during development.*

Clinical features

- Depigmented patches present on the ventral or lateral trunk and in mid extremities with sparing of hands and feet.
- Poliosis and white forelock may be associated. Deafness is not a feature.
- Piebaldism with deafness is referred to as Woolf syndrome.

84. Asbestosis all are features except

a) Pleural cancer

b) Lung carcinoma

c) Pleural effusion

d) Atelectasis

Correct Answer - D
Ans. is 'd' i.e., Atelectasis
Asbestos-Related Diseases :?

- Asbestos is a family of proinflammatory crystalline hydrated silicates that are associated with pulmonary fibrosis, carcinoma, mesothelioma, and other cancers.
- There are two distinct geometric forms of asbestos:

.. Serpentine chrysolite - most of the asbestos used in industry
2. Amphibole (crocidolite)

- Both serpentine and amphibole can cause all asbestos related diseases except for mesothelioma, which is usually associated with amphibole (crocidolite).

Asbestos related diseases consist of :?

- Localized fibrous plaques which may be calcified.
- Diffuse pleural fibrosis.
- Pleural effusion.
- Parenchymal interstitial fibrosis (asbestosis).
- Lung carcinoma —> Most common neoplasm associated with asbestos exposure.
- Mesothelioma of pleura and peritoneum —> most specific neoplasm associated with asbestos exposure. o Laryngeal and colon carcinomas.
- Stomach carcinoma.

85. Regeneration of liver after partial hepatectomyis example of ?

a) Hyperplasia

b) Hypertrophy

c) Both a and b

d) None of the above

Correct Answer - A
Ans. is 'a' i.e., Hyperplasia

86. Optic nerve meningioma arises from ?

a) Piamater

b) Duramater

c) Astrocytes

d) Arachnoid

Correct Answer - D

Ans. is 'd' i.e., Arachnoid

Optic Nerve Meningioma *:?*

- *These are invasive tumoursarising from the arachnoidal villi.*
- *Meningiomas invading the orbit are of two types :*

a) Primary intraorbitalmeningiomas

- These are also known as 'optic nerve sheath meningiomas'.
- These produce early visual loss associated with limitation of ocular movements, optic disc oedema or atrophy, and a slowly progressive unilateral proptosis.

b) *Secondary orbital meningiomas*

- These intracranial meningiomas, secondarily invade the orbit, either arise from the sphenoid bone or involve it en route to the orbit.
- Orbital invasion may occur through: floor of anterior cranial fossa, superior orbital fissure and optic canal.
- Meningioma affecting the greater and lesser wings of sphenoid and taking origin in the region of pterion, is the most common variety affecting the orbit secondarily.

87. CD4 count refers to ?

a) T helper cells

b) B cells

c) Cytotoxic cells

d) Both B And T Cells

Correct Answer - A
Ans. is 'a' i.e., T helper cells

88. Fibroma belongs to ?

a) Germ cell tumor

b) Sex cord stromal tumor

c) Surface epithelial stromal tumors

d) Metastatic tumors from non ovarian primary

Correct Answer - B
Ans. is 'b' i.e., Sex cord stromal tumor
granulosa-theca cell tumor
. Sertoli-leydig cell tumor
Sex cord stromal tumor

89. Endothelium activation refers to ?

a) Aberration of anatomy of vessel wall

b) Irreversible changes in functional state of vessel wall

c) Smooth muscle proliferation

d) Increased expression of adhesion molecules for leukocyte recruitment

Correct Answer - D
Ans. is 'd' i.e., Increased expression of adhesion molecules for leukocyte recruitment

- Vascular endothelium in its normal, unactivated state does not bind circulating cells or impede their passage.
- In *acute inflammation,* the endothelium is activated and can bind leukocytes as a prelude to their exit from the blood vessels.
- Inflammatory mediators like thrombin, IL - 1, Platelet Activating Factor, Histamine And TNFactivate endothelial cells by increasing expression of adhesion molecules which can bind leukocytes for leukocyte recruitment.

90. All are benign conditions except ?

a) Fibroadenoma

b) Cystosarcomaphyllodes

c) Pagets disease of nipple

d) Galactocele

Correct Answer - C
Ans. is 'c' i.e. Pagets disease of nipple
Benign breast disorder classification :?
a) Congenital disorders

- Inverted nipple
- Supernumerary breasts/nipples
- Non-breast disorders
- Tietze's disease (costochondritis)
- Sebaceous cysts and other skin conditions

b) Injury
c) Inflammation/infection
d) ANDI (aberations of normal differentiation and involution):

- Cyclical nodularity and mastalgia
- Cysts

e) Fibroadenoma
f) Duct ectasia/periductal mastitis
g) Phyllodes tumor (CystosarcomaPhyllodes)
h) Pregnancy-related

- Galactocele
- Puerperal abscess

91. Not a vessel wall condition leading to bleeding ?

a) Henoch-schonleinpurpura

b) Autoimmune thrombocytopenic purpura

c) Cushing's syndrome

d) Scurvy

Correct Answer - B

Ans. is `b' i.e., Autoimmune thrombocytopenic purpura

Bleeding disorders caused by vessel wall abnormalities are as follows :

- Infections: meningococcemia, rickettsioses
- Drug induced leukocytoclasticvasculitis
- Scurvy, EhlerDanlos syndrome, Cushing's syndrome
- Henoch-Schonleinpurpura
- Hereditary hemorrhagic telangiectasia (Weber-Osler-rendu syndrome)
- Perivascular amyloidosis

Note : *Autoimmune thrombocytopenic purpura is a bleeding disorder primarily caused due to thrombocvtopenia.*

92. Stone seen in urinary tract infection is ?

a) Calcium oxalate

b) Uric acid stones

c) Staghorn calculus

d) Cysteine stones

Correct Answer - C

Ans. is 'c' i.e., Staghorn calculus

Urolithiasis :?

- Calcium Oxalate stones → associated with hypercalcemia and hypercalciuria
- Staghorn Calculi → Large Magnesium ammonium phosphate stones formed in patients with infection of urine splitting organisms (Proteus and some staphylococci) followed by precipitation in alkaline urine.
- Uric acid stones → Patients with hyperuricemia
- Cystine stones → Genetic defect in renal reabsorption of cytine leading to cystinuria.

93. Which of the following is not a proinflammatory cytokine ?

a) IL 8

b) IL 11

c) IL 10

d) TNF alpha

Correct Answer - C
Ans. is 'c' i.e. IL 10

94. In internal injury in body leukocyte is recruited by ?

a) IL 1

b) Selectin

c) Integrin

d) IL 6

Correct Answer - A
Ans. is 'a' i.e., IL 1
Internal injury in the cells of the body is recognized by cy_tosolic receptors that identify a diverse set of molecules that are liberated or altered as a consequence of cell damage.

- *These molecules include*
- *Uric acid (a product of DNA breakdown),*
- *ATP (released from damaged mitochondria), reduced intracellular K+ concentrations (reflecting loss of ions because of plasma membrane injury),*
- *DNA when it is released into the cytoplasm and not sequestered in nuclei*
- *These receptors activate a multiprotein cytosolic complex called the inflammasome, which induces the production of the cytokine interleukin-1 (IL-1).*
- *IL-1 recruits leukocytes and thus induces inflanunation.*

95. Leukocyte migration through endothelium is induced by ?

a) Selectin

b) N CAM

c) C CAM

d) PECAM

Correct Answer - D
Ans. is 'd' i.e., PECAM

- Migration of the leukocytes through the endothelium is called transmigration or diapedesis.
- Transmigration of leukocytes occurs mainly in postcapillaryvenules.
- The molecules involved in transmigration are member of the immunoglobulin superfamily called CD31 or PECAM-1 (platelet endothelial cell adhesion molecule).

96. Most characteristic of megaloblastic anemia ?

a) Target cell

b) Macrocyte

c) Microovalocyte

d) Macroovalocyte

Correct Answer - D
Ans. is 'd' i.e., Macroovalocyte
. Most characteristic finding of megaloblastic anemia --> Macrocytes/Macroovalocytes.
. Earliest finding of megaloblastic anemia --> Hypersegmented neutrophils.

97. Tear drop cell together with leukoerythroblast seen in ?

a) Megaloblastic anemia

b) Iron deficiency anemia

c) Aplastic anemia

d) Primary myelofibrosis

Correct Answer - D
Ans. is 'd' i.e., Primary myelofibrosis
Primary Myelofibrosis :?

- The hallmark of primary myelofibrosis is the development of obliterative marrow fibrosis.
- The chief pathologic feature is the extensive deposition of collagen in the marrow by non-neoplastic fibroblasts.
- It is probably caused by the inappropriate release of fibrogenic factors; platelet-derived growth factor and TGF-fl from neoplastic megakaryocytes.
- Marrow distortion leads to the premature release of nucleated erythroid and early granulocyte progenitors (leukoerythroblastosis) in peripheral blood.
- Teardrop-shaped red cells (dacryocytes), cells that were probably damaged during the birthing process in the fibrotic marrow, are also often seen in peripheral blood.

98. Most specific antibody in SLE is ?

a) Anti nuclear

b) Anti Sm

c) Anti Ro

d) Anti histone

Correct Answer - B
Ans. is 'b' i.e., Anti Sm

99. Revised Ghent Criteria are used for the diagnosis of ?

a) Marfans syndrome

b) Ehler Danlos syndrome

c) Osteogenesis imperfecta

d) Duschene muscular dystrophy

Correct Answer - A

Ans. is 'a' i.e. Marfans syndrome

The clinical diagnosis of Marfan syndrome is currently based on "revised Ghent criteria" :?

- These take into account family history, cardinal clinical signs in the absence of family history, and presence or absence of fibrillin mutation.
- In general, major involvement of two of the four organ systems (skeletal, cardiovascular, ocular, and skin) and minor involvement of another organ is required for diagnosis.

100. Primary intentional healing which is true ?

a) Neovascularization is maximum by day 5

b) Neovascularization is maximum by day 3

c) Neutrophils appear at wound margins on day 3

d) The epidermis recovers its maximum thickness by day **7**

Correct Answer - A

Ans. is 'a' i.e., Neovascularization is maximum by day 5

Skin wound healing

- Skin wounds are classically described to heal by primary or secondary intention.

A. *Healing by primary intention*

- It occurs in wounds with opposed edges, e.g., surgical incision.
- The healing process follows a series of sequantial steps : ?

Immediate after incision

- Incisional space filled with blood containing fibrin and blood cells.
- Dehydration of the surface clot forms scab that covers the wound.

Within 24 hours

- *Neutrophils appear at the margins of wound.*

In 24-48 hours

- *Epithelial cells move from the wound edges along the cut margin of dermis, depositing basement membrane components as they move.*
- *They fuse in the midline beneath the surface scab, producing a continuous but thin epithelium layer that closes the wound.*

By day 3

- Neutrophils are largely replaced by macrophages.
- Granulation tissue progressively invades the incision space.

- Collegen fibers now present in the margin but do not bridge the incision.

By day 5

- Incisional space is largely filled with granulation tissue.
- Neovascularization is maximum.
- *Collegen fibrils become more abundant and begin to bridge the incision.*
- The epidermis recovers its normal thickness.

During second week

- Leukocytes and edema have disappeared.
- There is continued accumulation of collegen and proliferation of fibroblast.
- *By the end offirst month*
- *Scar is made up of a cellular connective tissue devoid of inflammatory infiltrate covered now by intact epidermis.*

B. *Healing by secondary intention*

- It occurs in wounds with seperated edges in which there is more extensive loss of cells and tissue.
- *Regeneration of parenchymal cells cannot completely restore the original architecture, and hence abundant granulation tissue grows.*

Healingby secondary from primary intention in several respects :

- Inflammatory reaction is more intense.
- Much larger amounts of granulation tissue are formed.
- Wound contraction occurs → Feature that most clearly differentiate secondary from primary healing.
- *Permanent wound contraction requires the action of myolifibroblasts - Fibroblasts that have the ultrastructural characteristic of smooth muscle cells.*

101. Alveolar hemorrhage and hemosiderin laden macrophages ?

a) Sarcoidosis

b) Goodpasture syndrome

c) Bronchial pneumonia

d) Bronchieactasis

Correct Answer - B

Ans. is 'b' Goodpasture syndrome

Goodpasture syndrome

- Goodpasture syndrome is a rare condition characterized by rapid destruction of the kidney and diffuse pulmonary hemorrhage.
- It is an autoimmune disease characterized by presence of circulating autoantibodies targeted against basement membrane of lung and kidney.
- These antibodies are directed against the noncollagenous domain of the a-3 chain of type IV collegen (collegen of basement membrane).
- The antibodies initiate an inflammatory destruction of the basement membrane in kidney glomeruli and lung alveoli.
- In Goodpasture syndrome, immune reaction is type II hypersensitivity.

Morphological changes

Lung

- The lungs are heavy, with areas of red brown consolidation.
- There is *focal necrosis of alveolar walls associated with intraalveolar hemorrhages.*
- Alveoli contain hemosiderin-laden macrophages.
- Linear deposits of immunoglobulins along the basement membranes of the septal walls.

Kidney

- Diffuse proliferative rapidly progressive glomerulonephritis.
- Focal necrotizing lesion and *crescents* in >50% of glomeruli.
- *Linear deposits of immunoglobulins and complement along glomerular basement membrane.*

Clinical manifestations

- Occur typically in *young males.*
- Most cases *begin* clinically with respiratory symptoms, principally *hemoptysis.*
- Soon, manifestations of glomerulonephritis appear and typically present as *nephritic syndrome* → hematuria, nephritic urinary sediment, subnephrotic proteinuria, rapidly progressive renal failure.
- The common cause of death is renal failure.

102. Most common primary malignant bone tumor -

a) Osteosarcoma

b) Osteochondroma

c) Multiple myeloma

d) Osteoclastoma

Correct Answer - C
Ans. is 'c' i.e., Multiple myeloma

103. SLE mitral and tricuspid valve vegetations are?

a) Salmon patch

b) Libmann sach's disease

c) Janeway lesions

d) Oslers nodes

Correct Answer - B

Ans. is 'b' i.e., Libmann sach's disease

Endocarditis of Systemic Lupus Erythematosus (Libman-Sach's Disease)

- **Mitral and tricuspid valvulitis** with small, sterile vegetations, called **Libman-Sach's endocarditis,** is occasionally encountered in **systemic lupus erythematosus.**
- Due to the use of steriods, the incidence of this complication has been greatly reduced.
- The lesions are **small (1 to 4 mm in diameter), single or multiple, sterile, pink vegetations with a warty (verrucous) appearance located on the undersurfaces of the atrioventricular valves, on the valvuar endocardium, on the chords, or on the mural endocardium of atria or ventricles.**

104. Which of the following is seen in kidney malignant hypertension?

a) Hyaline necrosis

b) Fibrinoid necrosis

c) Medial wall hyperplasia

d) Microaneurysm

Correct Answer - B

Ans. is 'b' Fibrinoid necrosis

Malignant nephrosclerosis is the form of renal disease associated with malignant or accelerated phase of hypertension.

Pathology of kidney in Malignant Hypertension

On Gross Inspection :

- The kidneys are normal in size or slightly enlarged. They have a smooth surface with numerous small *petechial hemorrhages.*
- These small pinpoint petechial hemorrhages appear on the cortical surface from rupture of arterioles or glomerular capillaries.

On Histology :

- Two distinct vascular lesions are seen :

Fibrinoid necrosis

- It affects the *arterioles* and is characterized by infiltration of arteriolar walls with eosinophilic material including fibrin, thickening of vessel walls and occasionally, an inflammatory infiltrate (necrotizing arteriolitis).

Hvperplastic arteriolitis

- This affects the *interlobular arteries* and *arterioles.*
- There is concentric hyperplastic proliferation of the smooth muscles together with fine concentric layering of collagen to form a hyperplastic arteriolitis (Onion skin lesion).

105. Nutmeg liver seen in ?

a) Alcoholic liver disease

b) Chronic venous congestion

c) Hepatoma

d) Secondary carcinoma deposits in liver

Correct Answer - B
Ans. is 'b' i.e., Chronic venous congestion
The combination of hypoperfusion and retrograde congestion (Chronic passive congestion) acts synergistically to generate centrilobular hemorrhagic necrosis.
The liver takes on a variegated mottled appearance reflecting hemorrhage and necrosis in the centrilobular regions, know as nutmeg liver.

106. Following all are antigens for antiphospholipid antibody except ?

a) Prothrombin

b) Erythrocyte membrane

c) Phospholipid

d) Beta 2 glycoprotein

Correct Answer - B

Ans. is 'b' i.e., Erythrocyte membrane

Antiphospholipid syndrome

- Antiphospholipid syndrome develops in patients expressing antibodies to anionic phospholip. i.e., antiphospholipid antibody or lupus **anticoagulant.**
- These antibodies not only act against phospholipid, as it was believed, but also against epitopes of plasma proteins.
- A variety of protein have been implicated; *2-glycoprotein particularly important, i.e.,* antiphospholipid antibody is directed against the **phospholipid - 2-glycoprotein complex.**
- Other proteins are prothrombin, protein S, protein C, annexin V.

Three antibody are particularly important :

- *Antiphospholipid* (anti Cardiolipin)
- *Anti-2-glycoprotein (i.e.,* against 2-glycoprotein component of phosphilipid-2-glycoprotein complex).
- A *nti-prothrombin*

107. True about atherosclerosis ?

a) Chronic inflammatory disorder of vessel wall

b) Not lead to complications of vessel wall

c) Thoracic aorta more than abdominal aorta

d) Atherosclerostic plaques do not demonstrate neovascularization

Correct Answer - A

Ans. is 'a' i.e., Chronic inflammatory disorder of vessel wall

Facts about atherosclerosis

Is a chronic inflammatory and healing response of the arterial wall to endothelial injury.

Atherosclerosis progresses in the following sequence:

Endothelial injury and dysfunction → Accumulation of lipoproteins (mainly LDL) Monocyte adhesion to the endothelium, followed by migration into the intima and transformation into macrophages and foam cells → Platelet adhesion factor release from activated platelets, macrophages, and vascular wall cells → Smooth muscle cell proliferation, extracellular matrix production, and recruitment of T cells → Lipid accumulation both extracellularly and within cells (macrophages and smooth muscle cell).

In descending order, the most extensively involved vessels are the **lower abdominal aorta,** the coronary arteries, the popliteal arteries, the internal carotid arteries, and the vessels of the circle of Willis. In humans, the **abdominal aorta is typically involved to a much greater degree than the thoracic aorta.**

108. Risk factor in cholangiocarcinoma ?

a) Pancreatitis

b) Caroli disease

c) Pyelonephritis

d) Ulcerative colitis

Correct Answer - B
Ans. is 'b' i.e., Caroli disease
Cholangiocarcinoma

- Cholangiocarcinoma is malignancy of the biliary tree, arising from bile ducts within or outside the liver.
- Risk factors :- All risk factors for cholangiocarcinomas cause chronic inflammation and cholestasis, which presumably promote occurrence of somatic mutations or epigenetic alterations in cholangiocytes.
- *Primary sclerosing cholangitis.*
- *Hepatolithiasis.*
- *Congenital fibropolycystic disease of the biliary system (caroli disease, choledochal cyst).*
- *Hepatitis B and C.*
- *Exposure to thorotrast.*
- *Opisthorchissinensis and clonorchis infection.*

109. Sign of chronic inflammation ?

a) Angiogenesis

b) Purulent exudate

c) Induration

d) Edema

Correct Answer - A

Ans. is 'a' i.e. Angiogenesis

Chronic inflammation is characterized by :?

- Infiltration with mononuclear cells, which include → macrophages, lymphocytes, and plasma cells
- Tissue destruction, induced → the persistent offending agent or by the inflammatory cells
- Attempts at healing → connective tissue replacement of damaged tissue, accomplished by *angiogenesis (proliferation of small blood vessels) and, in particular, fibrosis.*

110. Multiple connective tissue disorder not associated with ?

a) SLE

b) Systemic sclerosis

c) Polymyositis

d) Sjogren's syndrome

Correct Answer - D
Ans. is 'd' i.e., Sjogren's syndrome
Mixed connective tissue disorder *:?*

- *The term mixed connective tissue disease is used to describe a disease with clinical features that are a mixture of the features of* SLE, systemic sclerosis, and Polymyositis.
- The disease is characterized serologically by high titers of antibodies to ribonucleoprotein particle-containing Ul ribonucleoprotein.
- Typically, mixed connective tissue disease presents with synovitis of the fingers, Raynaud phenomenon and mild myositis, but renal involvement is modest and there is a good response to corticosteroids, at least in the short term.
- Serious complications of mixed connective tissue disease include pulmonary hypertension, interstitial lung disease, and renal disease.

111. Inhibition of platelet aggregation by ?

a) ADP

b) Thromboxane A2

c) Thrombin

d) Bradykinin

Correct Answer - D
Ans. is 'd' i.e., Bradykinin
Factors promoting platelet aggregation : ADP, TXA, epinephrine, serotonin, vWF, fibrinogen, collagen, immune complex, thrombin, thrombospondin.
o Factors inhibiting platelet aggregation: PGIr, NO, endothelin, bradykinin.

112. Cholemicnephrosis seen in ?

a) Addison's disease

b) Hemochromatosis

c) Hemochromatosis

d) Obstructive jaundice

Correct Answer - D

Ans. is 'd' i.e., Obstructive jaundice

<u>CholemicNephrosis 'Jaundice related Neuhropathyl</u>

- Cholemicnephrosis is used to describe the renal failure in patients with obstructive jaundice, particularly after renal transplantation.
- Diagnosis is made on light microscopy by presence of typical bilirubin casts.
- Altered hemodynamics and bile toxicity to tubular epithelial cells is the probable cause for renal failure in such patients.
- Patients usually have hepatorenal syndrome, reduced glomerular filtration rate and increased concentration of bile salts and bilirubin in urine.

113. Which of the following is the preformed toxin involved in mechanism of allergic rhinitis ?

a) Histamine

b) Leukotriene

c) TXA2

d) PGD2

Correct Answer - A
Ans. is 'a' i.e., Histamine

114. Arterial biopsy of elderly male shows fragmentation of elastic lamina, lymphocyte infiltration and giant cells ?

a) Temporal arteritis

b) Takayasu disease

c) Polyarteritisnodosa

d) Kawasaki disease

Correct Answer - A

Ans. is 'a' i.e., Temporal arteritis

***Giant* cell arteritis or temporal arteritis**

- It is the *most common form of systemic vasculitis in adults.*
- It is an acute and chronic, often granulomatous inflammation of arteries of large to small size.
- Giant cell arteritis affects principally the arteries in the head, especially the temporal arteries which is the extracranial branch of carotid artery.
- *Vertebral* and *ophthalamic arteries* may also be involved.
- Segment of affected artery develops nodular thickening with narrowing of lumen.
- There is granulomatous inflammation in the vessel wall with foreign body and Langhans type multinulated giant cells and fragmentation of internal elastic lamina.

Presentation of Giant cell arteritis

- Constitutional symptoms
- Most common nonspecific symptoms
- Include malaise, fatigue, anorexia and weight loss.
- These symptoms are due to generalized involvement of the body

and are not related to any organ involvement. o Headache

- It is most common vasculitis related symptom.
- Most commonly over temporal region.
- Jaw claudication
- It is *most specific* symptom of GCA.
- It is manifestated as pain in masseter when eating food that require vigrous chewing because oxygen demand of the masseter exceeds the supply provided by narrowed and inflamed arteries.
- Visual symptoms
- Diplopia and visual loss.
- Ophthalmic artery involvement can lead to *sudden blindness* which is the *most feared complication* of GCA.
- Polymylagia rheumatica
- Aching and stiffness of the shoulder, neck and lip girdle area.
- Arthritis
- Raised ESR
- Normocytic - Normochromic anemia

115. Hurthle cells seen in ?

a) Papillary carcinoma

b) Hashimoto Thyroiditis

c) Granulomatous thyroiditis

d) Thyroglossal cyst

Correct Answer - B
Ans. is `b' i.e., Hashimoto Thyroiditis
Pathological features of Hashimoto's thyroiditis
1. Cross features

- *Diffuse symmetrically enlarged thyroid*
- Although the gland is symmetrically enlarged, the accentuation of lobulations may make the gland appear lobular on gross examination.
- *Capsule is intact*
- Cut surface is pale, yellow firm and lobulated.

2. Microscopic features

- *Atrophy of thyroid follicles (atrophic follicles)*
- *Extensive lymphoplasmocytic infiltrate with abundant small lymphocytes and plasma cells* with *destruction of follicles.*
- *Oncocytic metaplasia (Hurthle cell metaplasia)* → The surviving follicular epithelial cells are commonly transformed into large cells with abundant pink cytoplasm and are known as *Hurthle cells.*
- *Oncocytic metaplasia (Hurthle cell metaplasia) is also known "oxyphilic change"* in epithelial cells and is considered the *hallmark of Hashimoto's thyroiditis.*
- Varying degree of fibrosis and foci of squamous metaplasia within atrophic follicles.
- Interstitial connective tissue is increased and may be abundant.

116. Causative organism of rheumatic fever ?

a) Group A Streptococci

b) Staphylococci

c) Group B Streptococci

d) Group D Streptococci

Correct Answer - A
Ans. is 'a' i.e., Group A Streptococci
<u>Rheumatic fever</u> :?
Rheumatic fever (RF) is an acute, immunologically mediated, multisystem inflammatory disease classically occurring a few weeks after an episode of group A streptococcal pharyngitis; occasionally, RF can follow streptococcal infections at other sites, such as the skin.

117. Grading of cancer based on ?

a) Differentiation

b) Tumor necrosis

c) Tumor size

d) Lymph node status

Correct Answer - A
Ans. is 'a' i.e. Differentiation
Based on the degree of differentiation of tumour cells, the number of mitoses or architectual forms.

118. Risk factor of CA cervix ?

a) Smoking

b) Sex at 25 yrs

c) Decreased parity

d) Single sexual partner

Correct Answer - A

Ans. is 'a' i.e., Smoking

Risk Factors associated with carcinoma cervix are as follows :?

- HPV infection - HPV 16: Squamous cell carcinoma, HPV 18: Adenocarcinoma o Early coitarche
- Increased parity
- Multiple sexual partners
- Smokers
- Lack of regular PAP smear screening
- Long term use of combined oral contraceptive pills

119. Temporal arteritis all are associated except ?

a) Elderly patient

b) Low ESR

c) Giant cells

d) Polymyalgia rheumatica

Correct Answer - B

Ans. is 'b' i.e., Low ESR

Temportal Arteritis is characterized by *:?*

- *Headache*
- *Jaw claudication*
- *Visual symptoms*
- *Polymyalgia rheumatica*
- *Arthritis*
- Raised ESR
- *NormocyticNormochronic anemia*

120. Type 5 hypersensitivity reaction is modification of ?

a) 1

b) 2

c) 3

d) 4

Correct Answer - B
Ans. is 'b' i.e., 2

121. Gleason's grading system is for ?

a) Carcinoma testis

b) Carcinoma colon

c) Carcinoma thyroid

d) Carcinoma prostate

Correct Answer - D
Ans. is `d' i.e., Carcinoma prostate
The Gleason Grading system is used to help evaluate the prognosis of men with prostate cancer.

122.

Carcinoid heart disease affects which part ?

a) Valvular endocardium

b) Pericardium

c) Myocardium

d) Epicardium

Correct Answer - A

Ans. is 'a' i.e., Valvular endocardium

Carcinoid Heart Disease

- Carcinoid heart disease is the cardiac manifestation of the systemic syndrome caused by carcinoid tumors. It generally involves *the endocardium and valve of the right side of heart.*
- Cardiovascular lesions consist of firm *plaque like endocardial fibrous thickenings on the inside surfaces of the cardiac chambers and the tricuspid and pulmonary valves.* Occasionally they involve the major blood vessels of the right side, the inferior vena cava and the pulmonary artery. These plaque like thickenings are composed *predominantly of smooth muscle cells and sparase collagen* fibres embedded in an acid mucopolysaccharide-rich matrix materials. Elastic fibers are not present in the plaque.
- *The most common cardiac manifestation is tricuspid regurgitation.* Stenosis of right sided valve may also develop.

  Why does right sided heart involvement more common ?
- Carcinoid tumors produce a variety of bioactive products that produce these (above described) heart lesions. Among these, *serotonin is most important.* Serotonin is inactivated during its passage through lung. As you all know, left side of heart recieve blood from pulmonary circulation, left sided hear lesions are uncommon (Because serotonin has already been metabolized in

lung).

- Similarly, gastrointestinal carcinoid tumors do not induce carcinoid heart disease (neither right nor left) as bioactive mediators released into the portal circulation are metabolized in the liver. Therefore carcinoid heart disease is produced by tumors that have extensive hepatic metastasis (liver releases the mediators directly into IVC) or carcinoid tumors of organs that are outside portal circulation (e.g., ovary).

123. ATM gene is located on ?

a) Chromosome 11

b) Chromosome 7

c) Chromosome 5

d) Chromosome 8

Correct Answer - A
Ans. is 'a' i.e., Chromosome 11
Ataxia-Telangiectasia
Is an autosomal recessive disorder characterized by an ataxic-dyskinetic syndrome beginning in early childhood, with the subsequent development of telangiectasias in the conjunctiva and skin, along with immunodeficiency. o The ataxia-telangiectasia mutated *(ATM)* gene located on chromosome 11q22-q23 encodes a kinase with a critical role in orchestrating the cellular response to double-stranded DNA breaks.

124. Cellular infiltrate seen in late pseudomonas infection is formed mainly by ?

a) Neutrophils

b) Lymphocytes

c) Monocytes

d) Plasma cells

Correct Answer - A

Ans. is 'a' i.e., Neutrophils

Chemotaxis of Leukocytes

- After exiting the circulation, leukocytes move in the tissues toward the site of injury by a process called *chemotaxis,* which is defined as locomotion along a chemical gradient.
- The nature of the leukocyte infiltrate varies with the age of the inflammatory response and the type of stimulus.
- In most forms of acute inflammation neutrophils predominate in the inflammatory infiltrate during the first 6 to 24 hours and are replaced by monocytes in 24 to 48 hours. There are, however, exceptions to this stereotypic pattern of cellular infiltration.
- In certain infections-for example
- Those produced by *Pseudomonas* bacteria-the cellular infiltrate is dominated by continuously recruited neutrophils for several days.
- In viral infections, lymphocytes may be the first cells to arrive.
- Some hypersensitivity reactions are dominated by activated lymphocytes, macrophages, and plasma cells (reflecting the immune response).
- And in allergic reactions, eosinophils may be the main cell type.

125. Strength of wound after 2 months is governed by?

a) Collagen cross linking

b) Excess collagen deposition

c) Both 'a' and `b'

d) None of the above

Correct Answer - A
Ans. is 'a' i.e., Collagen cross linking

Wound strength

- At the *end of first week,* wound strength is *approximately 10%* that of normal skin.
- Strength increases rapidly over the next 4 weeks.
- At the *end of third months,* the strength reaches a plateau of about 70 to 80% of the normal skin, a condition that may persist for life.
- So, (Remember following facts)
- *Tensile strength never reaches the normal strength of unwounded tissue (i.e., 100%).*
- *Maximum strength is achieved by the end of 3 months.*
- *Maximum strength is 70-80% of normal tissue.*

How does tensile strength change with time ?

- During first 2 months it is due to excess collegen deposition.
- After that it is due to structural modification of collegen, i.e., cross-linking, increased fiber size.

126. All are seen in primary extraglandalar sjogrens syndrome except ?

a) Rheumatoid arthritis

b) Raynaud's disease

c) Lymphoma

d) Splenomegaly

Correct Answer - A
Ans. is 'a' i.e., Rheumatoid arthritis
Primary Sjogren syndrome is not associated with other autoimmune disorders, e.g. Rheumatoid arthritis.
Sjogren syndrome occurs in *elderly* (50-60 yrs) female.

127. Most common site for Adenoid cystic carcinoma is ?

a) Minor Salivary glands

b) Parotid gland

c) Submandibular gland

d) Sublingual gland

Correct Answer - A
Ans. is 'a' i.e., Minor salivary glands

128. Tumor with appearance and consisteny of grape like clusters is ?

a) Embryonal rhabdomyosarcoma

b) Embryonal cell carcinoma

c) Adenocarcinoma

d) Clear cell carcinoma

Correct Answer - A
Ans. is 'a' i.e., Embryonal rhabdomyosarcoma
Carcinosarcoma of uterus
Carcinosarcomas consist of endometrial adenocarcinoma in which malignant sarcomatous (stromal) differentiation takes place.

129. Allergic BPA which kind of hypersensitivity reaction ?

a) Type I

b) Type II

c) Type III

d) Type IV

Correct Answer - A
Ans. is 'a' i.e., Type I

130. Psammoma bodies are seen in all the following except ?

a) Malignant mesothelioma

b) Somatostatinoma

c) Prolactinoma

d) Follicular carcinoma of thyroid

Correct Answer - D

Ans. is 'd' i.e., Follicular carcinoma of thyroid

Psammoma bodies can be seen in :?

- Papillary carcinoma of thyroid.
- Renal cell carcinoma (papillary type)
- Serous cystadenoma of ovary
- Meningioma
- Malignant mesothelioma (Peritoneal & pleural)
- Somatostatinoma (Pancreas)
- Prolactinomam (Pituitary)
- Endometrial papillary serous cystadenocarcinoma

131. Cytopathology deals with ?

a) Cellular changes for diagnosis of disease

b) Tissue changes for diagnosis of disease

c) Both 'a' and 'b'

d) None of the above

Correct Answer - A

Ans. is 'a' i.e., Cellular changes for diagnosis of disease

Cytology

- Cytology is the study of cells.
- Cytology is that branch of life science, which deals with the study of cells in terms of structure, function and chemistry.
- Robert Hooke is sometimes seen as the father of cytology.

132. FFP not used in ?

a) TTP

b) Factor XII deficiency

c) Vitamin K deficiency

d) Antithrombin III deficiency

Correct Answer - B
Ans. is 'b' i.e., Factor XII deficiency
Fresh frozen plasma (FFP)
FFP is defined as the fluid portion of human blood that has been centrifuged, separated, and frozen solid at -18°c within 6 hours.
FFP contains stable coagulation factors and plasma proteins :
(i) Fibrinogen
(iii) Albumin & Immunoglobulin
(v) Factor II, V, VII, IX, X, XI
(ii) Antithrombin
(iv) Protein C, S.
Indications for the use of FFP are : ?

- Deficiencies of factor II, V, VII, IX, X and XI when specific component therapy is neither available nor appropriate.
- Emergency reversal of warfarin effect.
- In vit K deficiency as replacement for Vit K dependent factors (II, VII, IX, X)
- Antithrombin III deficiency
- After massive blood transfusion.
- In immunodeficiency as a source of immunoglobulin
- TTP

133. Characteristic blood picture in megaloblastic anemia ?

a) Macrocytosis and increased reticulocyte count

b) Macrocytosis and decreased reticulocyte count

c) Microcytosis and increased reticulocyte count

d) Microcytosis and decreased reticulocyte count

Correct Answer - B

Ans. is 'b' i.e., Macrocytosis and decreased reticulocyte count

Findings of megaloblastic anemia

Peripheral blood

- *Macrocytosis megaloblastic RBC* → Due to nuclear/cytoplasmic asynchrony.
- Macrocytes lack central pallor of normal RBC.
- *Anisopoikilocytosis* → Marked variation in shape and size.
- Majority of RBCs appear as *macroovalcytes.*
- Few *tear drop cells.*
- Low reticulocyte count
- Some nucleated RBCs may appear (normally, during maturation of RBC, nucleus disappears).
- *Hyper-segmented neutrophils → First manifestation of megaloblastic anemia.*
- Large megakaryocytes with multilobate nuclei.
- Evidence of erythropoiesis : - Basophilic stippling, Cabott Ring, Howell-jolly bodies.

134. Chediak Higashi syndrome is characterized by?

a) Giant granules in leukocytes

b) Albinism

c) Mutation in LYST gene

d) All the above

Correct Answer - D
Ans. is 'd' i.e., All the above

- *The rapid antibody based diagnostic test/card test uses histidine rich protein 2 or lastate dehydrogenase.*
- *It is rapid simple sensitive and specific test.*

135. The earliest change seen in apoptosis is ?

a) Cell shrinkage

b) Pyknosis

c) Formation of apoptotic bodies

d) Fragmentation of cells

Correct Answer - A
Ans. is 'a' i.e., Cell shrinkage
Morphological changes in apoptosis

- Features of apoptosis are *:?*

1) Cell shrinkage : It is the earliest changes. It is due to damage to cytoskeletal proteins.
2) Chromatin condensation (pyknosis)/nuclear compaction : It is the most characteristic feature.
3) Formation of cytoplasmic blebs : It is the end stage of apoptosis.
4) Cytoplasmic eosinophilia.
5) Chromosomal DNA fragmentation : It is due to activity of endonuclease and caspases.
6) Formation of apoptotic bodies : These *are membrane bound round masses of eosinophilic cytoplasm with tightly packed orgaelles which may contain nuclear debries.* Important examples of apoptotic bodies are *civatte bodies, kamino bodies, councilman bodies, Tingible bodies, sunburn cells, satellite dyskeratotic cells, and eosinophilic globules.*
7) Phagocytosis of apoptotic cells and bodies by adjacent macrophages or healthy parenchymal cells.
8) Considerable apoptosis may occur before it becomes apparent on histological section.

Two very important differentiating features from necrosis are :?
A) Absence of inflammation.
B) Intact cell membrane.

136. Increased osmotic fragility seen in

a) Alpha thalasemmia

b) Beta thalassemia

c) Sickle cell anemia

d) Hereditary spherocytosis

Correct Answer - D

Ans. is 'd' i.e., Hereditary spherocytosis

Osmotic fragility of Red blood cells.

- Red blood cell osmotic fragility is the resistance of RBC hemolysis to osmotic changes.
- Normally RBC maintains osmotic equilibrium with the surrounding medium i.e., with serum that has 0.9% NaCI.
- As the surrounding medium becomes hypotonic fluid will enter into the cell along osmotic gradiant, eventually
- under very hypotonic conditions the cell will enlarge to capacity and rupture Osmotic lysis.
- *Osmotic fragility is determined by measuring the degree of hemolysis in hypotonic saline.*
- Normal red cell begins to lyse at 0·5% NaC1 and the hemolysis is complete at 0·3 NaCl.
- *Red blood cells osmotic fragility is considered to be increased if hemolysis occur in a NaCI concentration > 0-5%.*
- *Osmotic fragility is considered to be decreased if the hemolysis is not complete in a 0-3% of NaCI.*

137. Pernicious anemia associated with ?

a) Gastric pathology

b) Renal pathology

c) Esophageal pathology

d) Oral pathology

Correct Answer - A
Ans. is 'a' i.e., Gastric Pathology
Anemias of Vitamin B12 Deficiency: Pernicious Anemia

- *Pernicious anemia is a specific form of megaloblastic anemia caused by an autoimmune gastritis that impairs the production of intrinsic factor, which is required fir vitamin B12 uptake from the gut.*
- Histologically, there is a *chronic atrophic gastriti* smarked by loss of parietal cells, prominent infiltrate of lymphocytes and plasma cells, and megaloblastic changes in mucosal cells.

138. Insane paresis is associated with -

a) Syphilis

b) Leishmaniasis

c) Yellow fever

d) Nesseria meningitis

Correct Answer - A
Ans. is 'a' i.e., Syphilis
General paresis of insane

- Is a form of neurosyphilis, peaks in incidence 10 to 20 years after untreated Treponemapalliduminfection.
- It often starts with subtle cognitive and emotional changes, such as problems with concentration and irritability, and, if untreated, can lead to memory loss, confabulation, anomia, apraxia, or pseudobulbar palsy. The disease may mimic any psychiatric disorder, as well.
- One-half of the patients with neurosyphilis manifest dementia, of whom one-fourth of patients have prominent psychiatric manifestations, such as depression, paranoia, psychosis, or mania.
- A worsening of symptoms during the first 24 hours after the initiation of antibiotic treatment has been termed the Jarisch-Herxheimer reaction. With disease progression, there is loss of muscle tone, fine motor control, seizures, spasticity, and, eventually, paralysis and death.

139. Primary Membranous Nephropathy has antibodies against ?

a) Phospholipase Al receptor

b) Phospholipase A2 receptor

c) Phospholipase A3 receptor

d) Phospholipase A4 receptor

Correct Answer - B

Ans. is 'b' i.e., Phospholipase A2 receptor

Primary Membranous Nephropathy

- Primary (also called idiopathic) membranous nephropathy is considered to be an *autoimmune disease linked to certain HLA alleles such as HLA-DQA1 and caused in most cases by antibodies to a renal autoantigen.*
- In many adult cases the autoantigen is the phospholipase A receptor.
- The lesions bear a striking resemblance to those of experimental Heymann nephritis, which, as you might recall, is induced by antibodies to the megalin antigenic complex present in the rat podocyte, which is the antigenic counterpart of the human phospholipase A2 receptor.

140. T cell interleukins are all except ?

a) IL 1

b) IL 2

c) IL 4

d) IL 5

Correct Answer - A

Ans. is 'a' i.e., IL 1

Cytokines: Messenger molecules of immune system

- The induction and regulation of immune responses involve multiple interactions among lymphocytes, dendritic cells, macrophages, other inflammatory cells (e.g., neutrophils), and endothelial cells.
- Many cellular interactions and functions of leukocytes are mediated by secreted proteins called *cytokines.*
- Molecularly defined cytokines are called *interleukins,* because they mediate communications between leukocytes.
- Cytokines which contribute to different types of immune responses are as follows:
- In innate immune responses: TNF, IL-1, IL-12, type I IFNs, IFN-y,
- In adaptive immune responses (T cell): Inducer cytokines - IL-2, IL-4, IL-5, IL-17 and IFN-y; Terminating cytokines - TGF-P and IL-10.
- Stimulate hematopoiesis and are called *colony-stimulating factors:GM-CSF,* and IL-7.

141. Correct sequence in extravasation of leukocytes is ?

a) Margination - rolling- adhesion - transmigration

b) Transmigration- margination - rolling- adhesion

c) Rolling- adhesion- transmigration- margination

d) Adhesion- transmigration- margination- rolling

Correct Answer - A
Ans. is 'a' i.e., Margination-rolling-adhesion-transmigration
The sequence of events in the journey of leucocytes from the vessel lumen to interstitial tissue is called extravasation.

142. True about the basic structure of atherosclerosis plaque is ?

a) Concave part formed by fibrous cap

b) Convex part formed by tunica media of the vessel

c) Convex part formed by fibrous cap

d) Necrotic core contains collagen, elastin and proteoglycans

Correct Answer - C
Ans. is 'c' i.e., Convex part formed by fibrous cap
. The convex part is formed by the fibrous cap, which consists of smooth muscle cells, macrophages, foam cells, lymphocytes, collagen, elastin and proteoglycans.
. The central necrotic core is formed of cell debris, cholesterol crystals, foam cells and calcium.
. The concave part is formed by the tunica media of the vessel

143. TNF and IL1 are produced by ?

a) Neutrophils

b) Monocytes

c) Lymphocytes

d) Activated Macrophages

Correct Answer - D
Ans. is 'd' i.e., Activated Macrophages
Tumor Necrosis Factor (TNF) and Interleukin-1 (IL-1)
TNF and IL-I serve critical roles in leukocyte recruitment by promoting adhesion of leukocytes to endothelium and their migration through vessels.
These cytokines are produced mainly by activated macrophages and dendritic cells; TNF is also produced by T lymphocytes and mast cells, and IL-1 is produced by some epithelial cells as well.
The secretion of TNF and IL-1 can be stimulated by microbial products, immune complexes, foreign bodies, physical injury, and a variety of other inflammatory stimuli.

144. Celiac sprue is associated with ?

a) HLA DQ 1

b) HLA DQ2

c) HLA DQ3

d) HLA DQ4

Correct Answer - B
Ans. is 'b' i.e., HLA DQ2
. Celiac disease is a chronic malabsorption syndrome due to intestinal hlpersensitivity to gliadin, component of gluten in wheat, oat, barely and rye.
o Strongest association of coeliac disease is seen with HlA-DQ2followed by H2A-DQ8. Other HLA types (8& DR3 and, DR7) have also been associated.
. Coeliac disease may be associated with dermatitis herpetiformis

145. Which of the following is not involved in MEN II syndrome ?

a) Pituitary tumor

b) Medullary carcinoma of thyroid

c) Pheochromocytoma

d) Parathyroid adenoma

Correct Answer - A
Ans. is 'a' i.e., Pitutary tumor

146. Alpha 1 antitrypsin deficiency mechanism of transmission ?

a) Autosomal recessive

b) Autosomal dominant

c) X linked recessive

d) X linked dominant

Correct Answer - A
Ans. is 'a' i.e., Autosomal recessive

147. Reese ellsworth classification is used in ?

a) Retinoblastoma

b) Nephroblastoma

c) Rhabdomyosarcoma

d) Medulloblastoma

Correct Answer - A
Ans. is 'a' i.e., Retinoblastoma
The Reese-Ellsworth classification system was developed to predict the prognosis after treatment with radiation.

148. Chronic Right Heart Failure the appearance of liver ?

a) Congested

b) Shrinking

c) Fatty liver

d) Nodular

Correct Answer - A

Ans. is 'a' i.e., Congested

- Mallory bodies are *eosinophilic intracytoplasmic* inclusion bodies which are composed predominantly of *keratin intermediate filaments.*
- They are also known as *alcoholic hyaline.*
- These inclusions are characteristic but not specific feature of alcoholic liver disease, as they are also seen in other conditions.

149. Increased Prothrombin time results from deficiency of ?

a) Factor IX

b) Fibrinogen

c) Factor VI

d) Factor XI

Correct Answer - B

Ans. is 'b' i.e., Fibrinogen

Tests used to evaluate different aspects of hemostasis :

i) <u>Bleeding time</u>

- It is not a test for coagulation rathers it tests the ability of the vessels to vasoconstrict and the platelets to form a hemostatic plug.
- It is the time taken for a standardized skin puncture to stop bleeding.
- Normal reference value is between 2-9 minutes.
- Prolongation generally indicates the defect in platelet number or function.

ii) <u>Prothrombin time (PT)</u>

- This assay tests the extrinsic and common coagulation pathway.
- So, a Prolonged PT can result from deficiency of factor V, VII, X, prothrombin or fibrinogen.

iii) <u>Partial thromboplastin time (PTT)</u>

- This assay tests the intrinsic and common coagulation pathways.
- So, a prolonged PTT. can results from the deficiency of factor V, VIII, IX, X, XI, XII, prothrombin or fibrinogen.

iv) <u>Thrombin time</u>

- It is the time taken for clotting to occur when thrombin is added to the plasma.
- It tests the conversion of fibrinogen to fibrin and depends on

adequate fibrinogen level.

- Prolonged thrombin time results from decreased level of fibrinogen.

150. Thymic hyperplasia is seen in ?

a) Thymoma

b) Thymic lymphoma

c) Myasthenia gravis

d) Scleroderma

Correct Answer - C
Ans. is 'c' i.e., Mysthenia gravis
Thymic hvperplasia

- The term thymic hyperplasia usually applies to the appearance of B-cell germinal centers within the thymus, a finding that is referred to *as thymic follicular hyperplasia.*
- Such B-cell follicles are present in only small numbers in the normal thymus.
- It can occur in a number of chronic inflammatory and immunologic states, but it is most frequently encountered in myasthenia gravis (65% to 75% of cases).
- Similar thymic changes are sometimes encountered in Graves disease, systemic lupus erythematosus, scleroderma, rheumatoid arthritis, and other autoimmune disorders.

151. Cleft like space in atheromatous plaque contains

a) Cholesterol crystals

b) Smooth muscle cells

c) Fibrous tissue

d) None of these

Correct Answer - A
Ans. is 'a' i.e., Cholesterol crystals

152. Characteristic histopathology finding in Whipples disease is ?

a) PAS positive macrophages and rod shaped bacilli in lamina propria

b) Shortened thickened villi with increased crypt depth

c) Blunting and flattening of mucosal surface and absent villi

d) Mononuclear infiltration at base of crypts

Correct Answer - A
Ans. is 'a' i.e., PAS positive macrophages and rod shaped bacilli in lamina propria

- *The hallmark of Whipple's disease is a small intestinal mucosa laden with distended macrophages in the lamina propria- the macrophages contain periodic acid-schiff (PAS) positive granules and rod shaped bacilli by electron microscopy.*
- Three forms of Malabsorption Syndromes are often asked and the basic understanding of these is able to exclude a large number of questions.

153. Most common cause of inherited peripheral neuropathy is ?

a) Chartcot - Marie - Tooth disease

b) Hereditary neuropathy with pressure palsy

c) Familial amyloid polyneuropathy

d) Hereditary sensory neuropathy

Correct Answer - A
Ans. is 'a' i.e., Chartcot - Marie - Tooth disease
Charcot-Marie-Tooth (CMT) disease :?

- This is the most common of the inherited peripheral neuropathies, affecting up to 1 in 2500 people.
- This is a nerve conduction disease.
- Affected individuals are heterozygous for duplication of a small region of chromosome 17 (17p12).
- It is an autosomal dominant disorder

154. HLA I true is ?

a) Consists of A, B and C loci

b) Encodes complement region

c) Responsible for graft versus host response

d) Found only on cells of the immune system

Correct Answer - A
Ans. is 'a' i.e., Consists of A, B and C loci

155. Which of the following deficiency does not cause dilated cardiomyopathy ?

a) Calcium

b) Selenium

c) Manganese

d) Carnitine

Correct Answer - C
Ans. is 'c' i.e., Manganese
Some nutrient deficiency may also cause dilated cardiomyopathy e.g. deficiency of thiamine, selenium, carnitine, calcium, phosphate or magnesium.

156. Primary hyperaldosteronism doesn't lead to ?

a) Hyperkalemia

b) Hypernatremia

c) Hydrogen depletion and metablic alkalosis

d) Hypertension

Correct Answer - A

Ans. is 'a' i.e., Hyperkalemia

Clinical manifestations of hvperaldosteronism

- Excess activation of the mineralocorticoid receptor leads to potassium depletion and increased sodium retention, with the latter causing an expansion of extracellular and plasma volume.
- Increased ENaC activity also results in hydrogen depletion that can cause metabolic alkalosis.
- Aldosterone also has direct effects on the vascular system, where it increases cardiac remodeling and decreases compliance. Aldosterone excess may cause direct damage to the myocardium and the kidney glomeruli, in addition to secondary damage due to systemic hypertension.
- Hypokalemia can be exacerbated by thiazide drug treatment, which leads to increased delivery of sodium to the distal renal tubule, thereby driving potassium excretion.
- Severe hypokalemia can be associated with muscle weakness, overt proximal myopathy, or even hypokalemic paralysis. Severe alkalosis contributes to muscle cramps and, in severe cases, can cause tetany.

157. Ghons focus lies at ?

a) Left apical parenchymal region

b) Right apical parenchymal region

c) Sub pleural caesous lesion in right upper lobe

d) Sub pleural caesous lesion in left upper lobe

Correct Answer - C

Ans. is 'c' i.e., Right apical parenchymal region

Primary T.B. includes :?

- An area of grey white (size of approx. 1-1·50 cm) inflammatory consolidation - called ghon's focus. o Lymph node.
- Lymphatics and lymphatic channel.
- Cavity and fibrosis is seen in secondary T.B.
- Inhaled tubercule bacilli implanted in the distal air spaces of the *lower part of upper lobe or upper part of the lower lobe, close to the pleura.* This area is about 1 to 1.5 cm with caseating necrosis known as Ghon's focus.

Primary complex or Ghon's complex of tuberculosis consists of 3 components :

- Pulmonary compound or Ghon's focus.
- Draining lymphatics
- Caseating hilar lymphnode

Assman's focus

- The initial lesion in secondary tuberculosis at the apex of lung (infraclavicular) without any lymph node involvement is called Assman's focus.

Ghon's complex

- The initial lesion in primary tuberculosis at the periphery of the lung along with the enlarged peribronchial lymph node is called Ghon's

complex.

158. Flow cytometry is done to know ?

a) Rapid cell shrinkage

b) Blood flow to brain

c) Net O_2 supply to tissues

d) Amount of O_2 bound to hemoglobin

Correct Answer - A
Ans. is *'a' i.e.,* Rapid cell shrinkage

159. Alpha thalassemia is due to ?

a) Alpha chain deficiency

b) Alpha chain excess

c) Beta chain deficienc

d) Beta chain excess

Correct Answer - A
Ans. is 'a' i.e., Alpha chain deficiency
Alpha-thalassemia
People who do not produce enough alpha globin chain have alpha - thalassemia. Alpha globin chain is made by four genes, each gene contributes to 25% of the a-globin chains. The severity of a-thalassemia varies greatly depending on the number of a-globin genes affected -
i) Silent carrier state
Single a-globin gene is deleted. These individuals are completely asymptomatic.
ii) a-thalassemia trait
Two a-globin genes are deleted. These individuals are asymptomatic with some red cell abnormalities like β-thalassemia minor.
iii) HbH disease
Three genes of a-globin chain are deleted. With only one gene, the synthesis of a-chain is markedly reduced and tetramers of excess β-globin, called HbH, form. HbH has extremely high affinity for oxygen and therefore is not useful for oxygen exchange, leading to tissue hypoxia disproportionate to the level of hemoglobin. Patients have moderate to severe anemia that may require occasional blood transfusion.
iv) Hydrops fetalis

iv) Hydrops fetalis

There is deletion of all four a-globin genes. In the fetus, excess y-globin chains form tetramers, known as hemoglobin harts. *Hemolgobin bart has such a high affinity for oxygen that it delivers almost no oxygen to tissues.* Most individuals die before or shortly after birth. In utero blood transfusion have allowed the birth of children with hydrops fetalis who then require life long blood transfusions.

160.

Multiple myeloma most common part involved is?

a) Bone marrow

b) Cortex of bone

c) Metaphyses

d) Epiphyses

Correct Answer - A

Ans. is 'a' i.e., Bone marrow

Multiple myeloma

- Multiple myeloma is a plasma cell neoplasm characterized by involvement of the skeleton at multiple sites.
- Plasma cells proliferate abnormally and the proliferated plasma cells infiltrate various organs, particularly bone marrow, but can also spread to lymph nodes and extranodal sites like skin.
- The proliferation and survival of myeloma cells are dependent on several cytokines, IL-6 is particularly important.
- The neoplastic plasma cells secrete abnormally large amounts of immunoglobulin.
- The immunoglobulin secreted by neoplastic plasma cells are quiet different form the immunoglobulin normally present in the blood.
- The normal immunoglobulin consists of two heavy and two lights chains molecules and the production of both chain is tightly balanced.

The immunoglobulin secreted in this condition may be :-

- Isolated light chain or heavy chain.
- May be an intact antibody molecule of any heavy chain subclass.
- May be an altered antibody or fragment.

161. Anti thyroglobulin antibodies seen in

a) Hashimoto thyroiditis

b) Graves disease

c) De quervain thyroiditis

d) Subacute lymphocytic thyroiditis

Correct Answer - A
Ans. is 'a' i.e., Hashimoto thyroiditis
Antithyroglobulin antibody
Antibody directed against a component of colloid
Antimicrosomal antiboily
AntibODY AGAINST TSH receptor

162. Salt loosing nephropathy seen in

a) Amyloidosis

b) Lupus nephritis

c) Post streptococcal glomerulonephritis

d) Interstitial nephritis

Correct Answer - D
Ans. is 'd' i.e., Interstitial nephritis
Tubulo-interstitial diseases (interstitial nephritis) are characterized by salt wasting, therefore are also called salt-wasting nephritis.

163. Which of the following is not a cause of acute pancreatitis ?

a) Hypercalcemia

b) Thrombotic thrombocytopenic purpura

c) Cystic fibrosis

d) Magnetic resonance cholangiopancreatography (MRCP)

Correct Answer - D

Ans. is 'd' i.e., Magnetic resonance cholangiopancreatography (MRCP)

Causes of Acute Pancreatitis

Common causes

- Gallstones (including microlithiasis) - most common
- Hypertriglyceridemia
- Endoscopic retrograde cholangiopancreatography (ERCP), especially after biliary manometry. Trauma (especially blunt abdominal trauma)
- Postooperative (abdominal and nonabdominal operation)
- Drugs (L-asparginase, thiazide diuretics, frusomide, estrogens, azathioprime, 6-mercaptopurine, methyldopa, sulfonamide, tetracyclin, valproic acid, anti-HIV medicacations)
- Sphincter of Oddi dysfunction

Uncommon causes

- Vascular causes and vasculitis (ischemic-hypoperfusion states after cardiac surgery)
- Connective tissue disorders and thrombotic thrombocytopenic purpura (TTP)
- Cancer of the pancreas Hypercalcemia
- Periampullary diverticulum Pancreas divisum

- Hereditary pancreatitis Cystic fibrosis
- Renal failure

164. Which of the following is not due to genetic mutation -

a) Diabetes mellitus type II

b) Cystic fibrosis

c) Hemophilia

d) Alpha 1 antitrypsin deficiency

Correct Answer - A

Ans. is 'a' i.e., Diabetes mellitus type II

Disorders with multifactorial inheritance :

The multifactorial disorders result from the combined actions of environmental influences and two or more mutant genes having additive effects.

Multifactorial disorders are:

- Cleft lip/cleft palate
- Coronary heart disease
- Congenital heart diseases
- Hypertension
- Diabetes mellitus type II
- Gout
- Pyloric stenosis
- Other options in question i.e. hemophilia, alpha-1 antitrypsin deficiency, and cystic fibrosis are due t genetic mutations.

Note: Diabetes insipidus is X linked recessive disorder due to genetic mutation.

165. Psammoma bodies are seen in all except ?

a) Seminaoma

b) Meningioma

c) Pappilary carcinoma of thyroid

d) Pappilary serous cystadenocarcinoma of the ovary

Correct Answer - A
Ans. is 'a' i.e., Seminoma
Psammoma bodies represent a process of dystrophic calcification. Single necrotic cells may constitute seed crystals that become encrusted by the mineral deposits. The progressive acquisition of outer layers may create lamellated configurations, called psammoma bodies because of their resemblance to grains of sand.
Psammoma bodies are seen in :

- *Papillary cancer of thyroid*
- *Meningioma*
- *Papillary serous cystadenocarcinoma of ovary*

166. Examples of metaplasia are the following except?

a) Breast enlargement at puberty

b) Barrets esophagus

c) Myositis Ossificans

d) Respiratory tract in chronic smokers

Correct Answer - A
Ans. is 'a' i.e., Breast enlargement at puberty

167. The term sentinel lymph node was first used by?

a) Gould

b) Norman

c) Giuliano

d) Cabanas

Correct Answer - A
Ans. is 'a' i.e., Gould
The sentinel lymph node is the hypothetical first lymph node or group of nodes draining a cancer.
The term sentinel lymph node was first used by Gould.

168. True about Apoptosis are all except-

a) Inflammation is present

b) Chromosomal breakage

c) Clumping of chromatin

d) Cell shrinkage

Correct Answer - A
Ans. is 'a' i.e.,, Inflammation is present
The two most striking features of apoptosis are:

- *In contrast to necrosis it does not elicit inflammation*
- *Considerable apoptosis may occur in tissues before it becomes apparent in histological section (because it occurs very rapidly).*

169. Specific stain for myeloblasts is ?

a) Sudan black

b) PAS

c) Myeloperoxidase

d) LAP

Correct Answer - C

Ans. is 'c' i.e., Myeloperoxidase

Myeloperoxidase stain

Distinguishes between the immature cells in acute myeloblastic leukemia (cells stain positive) and those in acute lymphoblastic leukemia (cells stain negative).

Sudan black B stain

This stain distinguishes between acute lymphoblastic leukemia (cells stain positive) and acute myeloblastic leukemia (cells stain negative).

Periodic acid-Schiff stain (PAS)

Is primarily used to identify erythroleukemia, a leukemia of immature red blood cells.

Terminal deoxynucleotidyl transferase stain (TdT)

Differentiates between acute lymphoblastic leukemia (cells stain positive) and acute myelogenous leukemia (cells stain negative).

Leukocyte alkaline phosphatase (LAP)

Is used to determine if an increase of cells is due to chronic myelogenous leukemia or a noncancerous reaction to an infection or similar conditions. Cells from a noncancerous reaction stain positive with many intense blue granules; cells from chronic myelogenous leukemia have few blue granules.

Tartrate-resistant acid phosphatase stain (TRAP)

Is primarily used to identify hairy cell leukemia cells.

Leukocyte specific esterase

This stain identifies granulocytes, which show red granules.

170. Turner syndrome, true is ?

a) XYchromosomal abnormality

b) Tall stature, small testes

c) Preductalcoarctation of aorta

d) Presence of testes

Correct Answer - C

Ans. is 'c' i.e., Preductalcoarctation of aorta

Turner's syndrome

- Turner's syndrome is the most common sex chromosomal disorder in phenotypic females.
- Turner's syndrome results from complete or partial loss of one X chromosome (45, X) and is characterised by hypogonadism in phenotypic females

Features of Turner syndrome in children :?

- The most severely affected patients generally present during infancy with edema (owing to lymph stasis) of the dorsum of the hand and foot and sometimes swelling of the nape f the neck.
- **Swelling of the neck is related to markedly distended lymphatic channels, producing so called** cystic hygroma.
- As these infants develop, the swelling subsides but often leave bilateral neck webbing and persistent looseness of skin on the back of the neck.
- **Congenital heart disease** is also common, particularly preductal coarctation of Aorta and bicuspid Aortic valve.
- C. VS abnormalities are most important cause of mortality in children with Turner 's syndrome.
- *Features of Turner's syndrome in Adolescents and Adult:-*
- At puberty there is *failure to develop normal secondary sex*

characteristics.

- The genitalia remains *infantile,* breast development is *inadequate* and there is little pubic hair. *Nipples are widely spaced.*
- Turner syndrome is the single most important cause of primary amenorrhoea accounting for approximately $^{1}/3$ of the cases.
- *Short stature* (height rarely exceeds 150 cm).
- The mental status of these patients *is usually normal* but subtle defects in nonverbal, visual spatial information processing have been noted *(mental retardation is associated with the presence of extra chromosome* not with loss of X chromosome).
- About 50% of the patients develop autoantibodies directed to the *thyroid gland* and upto one half of these patients develop *hypothyroidism.*
- Other features include *low posterior hairline, webbing of neck, cubitus valgus, streak ovaries.* o Glucose intolerance, obesity and insulin resistance are also seen.

171. Chediak Higashi syndrome is characterisedwhich of the following defect of patelets?

a) Platelet formation

b) Platelet adhesion

c) Platelet aggregation

d) Platelet granule release

Correct Answer - D
Ans. is 'd' i.e., Platelet granule release

172. All are features of reversible injury of cell, except?

a) Blebs

b) Amorphous densities in mitochondrial matrix

c) Loss of microvlli

d) Cellular swelling

Correct Answer - B
Ans. is 'b' i.e., Amorphous densities in mitochondrial matrix
Formation of amorphous densities in the mitochondrial matrix is a feature of irreversible injury and not reversible injury.

173. Gaucher cell which stain is used -

a) Periodic Acid Sciff

b) Von Kossa

c) Oil red O

d) Sudan Black

Correct Answer - A
Ans. is 'a' i.e., Periodic Acid Sciff
Morphology of Gauchers disease:

- Glucocerebrosides accumulate in massive amounts within phagocytic cells throughout the body in all forms of Gaucher disease.
- The distended phagocytic cells, known as Gaucher cells, are found in the spleen, liver, bone marrow, lymph nodes, tonsils, thymus, and Peyer patches. Similar cells may be found in both the alveolar septa and the air spaces in the lung.
- In contrast to other lipid storage diseases, Gaucher cells rarely appear vacuolated but instead have a fibrillary type of cytoplasm likened to crumpled tissue paper.
- Gaucher cells are often enlarged, sometimes up to 100 ?m in diameter, and have one or more dark, eccentrically placed nuclei. Periodic acid-Schiff staining is usually intensely positive.
- With the electron microscope the fibrillary cytoplasm can be resolved as elongated, distended lysosomes, containing the stored lipid in stacks of bilayers.

174. BRCA 1 and 2 are located in which chromosome?

a) 13 and 17

b) 17 and 13

c) 11 and 13

d) 13 and 11

Correct Answer - A
Ans. is 'a' i.e., 13 and 17

175. Acute GVHD is caused by?

a) B lymphocyte

b) T lymphocyte

c) Macrophage

d) NK cell

Correct Answer - B
Ans. is 'b' i.e., T lymphocyte
Graft versus host (gvh) diseases
Graft versus host disease occurs in any situation in which *immunologically competent cells* or their precursors are transplanted into *immunologically crippled patients* and the transferred cells recognize *alloantigens* in the host.
Graft versus host disease occurs most commonly in the setting of *allogenic bone marrow transplantation* but may also follow transplantation of solid organs rich in lymphoid cells (e.g. the liver) or transfusion of unirradiated blood.
Recipients of bone marrow transplants are *immunodeficient because of either their primary disease or prior treatment of the disease with drugs or irradiation.*
When such recipients receive normal bone marrow cells from allogenic donors, the *immunocompetent, T cells* present in the donor marrow recognizes the *recipient's HLA antigen* as foreign *antigen* and react against them. Both $CD4^+$ and $CD8^+$T cells recognize and attack host tissues.
In clinical practice GVH can be so severe that bone marrow transplants are done only between *HLA matched donor and recipient.*

176. Bite cells are seen in?

a) G 6 PD deficiency

b) Hereditary spherocytosis

c) SCA

d) Trauma

Correct Answer - A
Ans. is 'a' i.e., G 6 PD deficiency

177. Pseudolaminar necrosis is a feature of ?

a) Cerebral infarct

b) Renal infarct

c) Hepatic infarct

d) Cardiac infarct

Correct Answer - A
Ans. is 'a' i.e., Cerebral infarct
In the cerebral neocortex the neuronal loss and gliosis are uneven, with preservation of some lavers and destruction of others. producing a pattern of injury termed pseudolaminar necrosis.

178. Crumpled paper appearance of cells is a feature of ?

a) Gaucher disease

b) Asbestosis

c) GVHD

d) Wilsons disease

Correct Answer - A
Ans. is 'a' i.e., Gaucher disease
Morphology of Gauchers disease:

- Glucocerebrosides accumulate in massive amounts within phagocytic cells throughout the body in all forms of Gaucher disease.
- The distended phagocytic cells, known as Gaucher cells, are found in the spleen, liver, bone marrow, lymph nodes, tonsils, thymus, and Peyer patches. Similar cells may be found in both the alveolar septa and the air spaces in the lung.

179. Gene for alpha and beta globin chains of hemoglobin are located on which chromosomes?

a) 16 and 11

b) 11 and 16

c) 9 and 11

d) 11 and 9

Correct Answer - A
Ans. is 'a' i.e., 16 and 11

180. Not true about apoptosis ?

a) Increase in lysosomal enzyme

b) Increase in caspases

c) Phosphatidyl serine has important role

d) Internucleosomal cleavage of nucleus

Correct Answer - A
Ans. is 'a' i.e., Increase in lysosomal enzyme
Apoptosis

- *Caspases are central to the pathogenesis of apoptosis.*
- *The lysis in apoptosis is caused due to action of caspase.*
- *Mitochondrias are the most important organelles involved in initiation and regulation of apoptosis.*
- *Hallmark of apoptosis is permeability of the mitochondrial membrane.*
- *Normally phosphatidyl serine is located on the inner cytosolic surface of plasma membrane*
- *In apoptotic cell this phosphatidyl serine is translocated to the outer (extracellular) surface of plasma membrane.*
- *Lysosome and other organelles remain intact.*

181. Favourable prognosis for AML with ?

a) t(8,21)

b) Deletion 5q

c) Preceeding MDS

d) Age < 2years

Correct Answer - A
Ans. 'a' i.e., t(8,21)
Monsomies (eg. -5 or -7) carry poor prognosis.
Prognostic factors of AML

- *There are many prognostic factors for AML of particular note are : -*
- Age : - Age *greater than 65 years or less than 2 years* has been associated with *poor prognosis* independent of cytogenetics.
- AML evolving from prior myelodysplastic syndrome (MDS) is associated with poor prognosis.
- Leukocytosis and/or an elevated peripheral blast count are associated with poor prognosis.
- Cytogenetics : - AML prognosis is currently separated into three broad categories based on cytogenic results:- o *Favourable : inv (16),* t (15:17), t (8 : 21).
- *Intermediate :* Normal, + 8, + 21, +22, del (7q), del (9q), Abnormal 11 q23.
- *Unfavorable :* - -5, -7, complexes with 5 chromosomes involved, del (5q), abnormal 3q, abnormal 17p.

182. Alpha 1 antitrypsin deficiency is associated with?

a) Panacinar-emphysema

b) Centriacinar-emphysema

c) Paraseptal-emphysema

d) Irregular-emphysema

Correct Answer - A

Ans. is 'a' i.e., Panacinar-emphysema

Emphysema

- Emphysema is a condition of the lung characterized by abnormal permanant enlargement of the airspaces *distal to the terminal bronchioles,* accompanied by *destruction of their walls* and without obvious fibrosis. "Destruction of walls" is necessory to define emphysema. Enlargement of airspaces without destruction of their walls is termed overinflation, for example, the distention of airspaces that occurs in the remaining lung after unilateral pneumonectomy.

Types of emphysema

- Emphysema is classified according to its anatomic distribution within the lobule. There are four major types of emphysema ?

1. Centriacinar (centrilobular) emphysema

- Centriacinar emphysema is the *most common type* of emphysema seen clinically. It is chracterized by *involvement of respiratory bronchioles, i.e. central (proximal) part of the acinus.* So, both emphysematous and normal airspaces exist within the same acinus and lobule.
- The lesions are more common and more severe in the *upper lobe, particularly in the apical segments.*
- This is the type of emphysema that occurs predominantly in heavy

smokers and usually coexists with chronic bronchitis.

2. Panacinar (Panlobular) emphysema

- The acini are uniformly enlarged from the level of the respiratory bronchiole to the terminal blind alveoli.
- This type of emphysema tends to occur more commonly in the lower zones and in the anterior margins of the lung, and it is usually most severe at the base.
- This type of emphysema is *associated with al-antitrypsin deficiency.*

3. Distal acinar (Paraseptal) emphysema

- This type of emphysema involves distal part of the acinus, while proximal part is normal. It is localized adjacent to the pleura, along perilobular septa.
- The involvement is seen adjacent to areas of fibrosis, scarring, or atelectasis and is usually more severe in the *upper half of lungs.*
- This type of emphysema is a common cause of *spontaneous pneumothorax in young adults.*

4. Irregular emphysema (Para-cicatricial emphysema)

- The acinus is involved irregularly and is almost invariably associated with scarring. *It is the most common type of emphysema histologically.*
- *Most common type of emphysema is irregular emphysema,* but it is not clinically significant as most patients are asymptomatic and it is only an autopsy finding. *Most common type of emphysema seen clinically is centracinar emphysema.*

183. Mesothelioma associated with which variety of asbestos ?

a) Serpentine

b) Amphibole

c) Both the above

d) None of the above

Correct Answer - B
Ans. is 'b' i.e., Amphibole
Asbestos-Related Diseases
Asbestos is a family of proinflammatory crystalline hydrated silicates that are associated with pulmonary fibrosis, carcinoma, mesothelioma, and other cancers.
There are two distinct geometric forms of asbestos
i) Serpentine (chrysolite) - most of the asbestos used in industry
ii) Amphibole (crocidolite)
Both serpentine and amphibole can cause all asbestos related diseases except for mesothelioma, which is usually associated with amphibole (crocidolite).

184. Atherosclerosis initiation by fibroblast plaque is mediated by injury to ?

a) Smooth muscle

b) Media

c) Adventitia

d) Endothelium

Correct Answer - D

Ans. is 'd' i.e., Endothelium

- The most acceptable hypothesis for the pathogenesis of atherosclerosis is "the response to injury hypothesis".
- According to this hypothesis, atherosclerosis is a chronic inflammatory response of the arterial wall initiated by injury to endothelium.

Pathogenesis of atherosclerosis

- Following stages occurs in the pathogenesis of Atherosclerosis:
- Endothelial injury
- Earliest stages of the development of atherosclerosis are mediated by the *inflammatory cascade.*
- Inflammation mediated injury to endothelium is the cornestone in the development of atherosclerosis.
- After injury, endothelium is activated and there is increased expression of adhesion molecule-VCAM-1 and
- there is increased permeability to endothelium.
- TNF is the major cytokine to induce this expression.

Migration of leukocytes

- When VCAM-1 is expressed on endothelium, leukocytes adhere to the endothelium.
- Leukocytes than cross the endothelial barrier and begin to

accumulate in subendothelial intimal space.

- Macrophages engulf LDL cholesterol and form foam cells → *formation of earliest lesion, i.e. fatty streak.*
- Macrophages also form oxygen free radicals that cause oxidation of LDL to yield *oxidized LDL (modified **LDL).***
- Smooth muscle cell migration and proliferation
- Inflammatory cells in subendothelial intimal space secrete cytokines, mainly PDGF, TGF-ct and FGF which cause migration of smooth muscle cells from media to subendothelial intimal space as well as their proliferation.

***Maturation* of plaque**

- Smooth muscle cells synthesize extracellular matrix (especially collegen) and convert a fatty streak into a mature fibrofatty atheroma, and contribute to the progressive growth of atherosclerotic lesions.

185. Complement having cell lytic property ?

a) MAC

b) C3b

c) C3a

d) C5a

Correct Answer - A
Ans. is 'a' i.e., MAC
C_{5-9} Called membrane attack complex (MAC). It forms channel in the lipid membrane and causes cell lysis (including bacteria).

186. Pathological features of acute rheumatic fever include following except?

a) Aschoff bodies

b) Pancarditis

c) MacCallum patch

d) None of the above

Correct Answer - D
Ans. is 'd' i.e., None of the above

187. Important step in activation of naïve CD 4+ T cells and initiation of cell mediated immune response is played by Interleukin?

a) 1

b) 2

c) 3

d) 4

Correct Answer - B
Ans. is 'b' i.e., 2
Activation of CD4+ T Cells:

- Naive CD4+ T cells recognize peptides displayed by dendritic cells and secrete IL-2, which functions as an autocrine growth factor to stimulate proliferation of the antigen- responsive T cells.
- The subsequent differentiation of antigen-stimulated T cells to T_H1 or T_H17 cells is driven by the cytokines produced by APCs at the time of T-cell acti- vation.
- In some situations the APCs (dendritic cells and macrophages) produce IL-12, which induces differentiation of CD4+ T cells to the T_H1 subset. IFN-y produced by these effector cells promotes further T_H1 development, thus amplifying the reaction.
- If the APCs produce inflammatory cytokines such as IL-1, IL-6, and a close relative of IL-12 called *IL-23,* these stimulate differentiation of T cells to the T_H17 subset.

188. Mesangial deposition of electron dense substance seen in?

a) IgA nephropathy

b) Membranous nephropathy

c) Minimal change disease

d) Post streptococcal glomerulonephritis

Correct Answer - A
Ans. is 'a' i.e., IgA nephropathy
IgA Nephropathy: shows presence of electron dense deposits in the mesangium.

189. Most common type of carcinoma lung is?

a) Small cell carcinoma

b) Adenocarcinoma

c) Squamous cell carcinoma

d) Large cell carcinoma

Correct Answer - B
Ans. is 'b' i.e., Adenocarcinoma

190. The mutation in cystic fibrosis is on which chromosome ?

a) 7p

b) 7q

c) 5p

d) 5q

Correct Answer - B
Ans. is 'b' i.e., 7q
Cystic fibrosis
Cystic fibrosis is an inherited disease of the mucus and sweat glands.
Cystic fibrosis follows on *autosomal recessive transmission.*
There is a *defect in ion transport of epithelial cells* that affects fluid secretion in
i) Exocrine glands (pancreas)
ii) Epithelial lining of respiratory, gastrointestinal and reproductive tract.

191. Which of the following combinations of cytogenetic abnormality and associated leukemia/lymphoma is incorrect?

a) t (8:14) Burkitt's lymphoma

b) t (15:17) Promyelocytic leukemia

c) t (9:18) CML

d) t (4:11)ALL

Correct Answer - C
Ans. is 'c' i.e., t (9:18) CML

192. Heart failure cells are seen in ?

a) Heart

b) Lungs

c) Kidney

d) Liver

Correct Answer - B
Ans. is 'b' i.e., Lungs
Heart failure cells (siderophages) are hemosiderin containing macrophages in alveoli that are seen in left ventricular failure and denote previous episodes of pulmonary edema.
Left sided heart failure
The major morphological and clinical effects of LVF are due increased back pressure in pulmonary circulation and the consequences of diminished peripheral blood pressure and flow.
The extracardiac organs involved commonly are ?
1. Lung (most common)
2. Kidney
3. Brain

Lung

- Pressure in the pulmonary veins increases and transmitted retrogradely to capillaries and arteries. o This results in *pulmonary congestion* and *pulmonary-edema --> Wet lung.*
- There is perivascular and interstitial transdate, particularly in the interlobular septa —> responsible for kerley's `B' lines on X-rays.
- Edematous fluid accumulates in alveoli.
- Iron containing proteins and hemoglobin leak out from the capillaries, and are phagocytosed by macrophages and converted to hemosiderin.

- Hemosiderin - containing macrophages in the alveoli (called siderophages, or heart failure cells) denote previous episodes of pulmonary edema.
- The clinical manifestations of LVF are primarily due to these changes in lungs —> Dysnea, orthopnea, paroxysomal nocturnal dysnea.

Kidney

- Decreased cardiac output causes a reduction in renal perfusion.
- If it is severe enough to impaire the excretion of nitrogenous product (BUN, Creatinine), Prerenal ARF (Prerenal azotemia) may be precipitated.

Brain

- Reduced perfusion to brain may cause hypoxic / ischemic encephalopathy.

193. AntiLKM antibody is seen in ?

a) Hepatitis A

b) Hepatitis C

c) Hepatitis D

d) Autoimmune hepatitis type II

Correct Answer - D
Ans. is 'd' i.e., Autoimmune hepatitis type II

194. Most common cause for complication of blood transfusion is?

a) Human error

b) Anaphylaxis

c) GVHD

d) Presensitisation

Correct Answer - A
Ans. is 'a' i.e., Human error
The most common cause resulting in complications from blood transfusion is human error
Acute hemolytic reaction resulting from ABO incompatibility is the most serious complication of blood transfusion.

195. Pathway activated on contact with glass test tube by itself is termed ?

a) Intrinsic pathway

b) Extrinsic pathway

c) Both the above

d) None of the above

Correct Answer - A

Ans. is 'a' i.e., Intrinsic pathway

Contact with negatively charged surfaces activates the Intrinsic pathway of coagulation & not the Extrinsic pathway, Intrinsic pathway is also referred to as' contact pathway' and factor XII is also known as contact factor for its role in the initiation of coagulation on contact with negatively charged surfaces.

Activation of coagulation pathway

Intrinsic and extrinsic pathways are activated by different mechanisms :?

1) Intrinsic pathway

The intrinsic pathway is largely an 'in vitro'pathway of coagulation. However, it may be activated 'in vivo' also.

i) 'In vitro' activation :- Intrinsic pathway may be activated 'in vitro' upon interaction of factor XII (Hageman factor or contact factor) with *negatively charged surface* such as glass, kaolin, dextran sulphate, ellagic acid, celite, or bismuth subgallate and interaction with hydrophobic surfaces.

ii) 'In vivo ' activation :- 'in vivo' activation occurs as a result of contact activation of factor XII from subendothelial collagen and other components (platelets) following endothelial injury to blood vessels.

As intrinsic pathway is largely an 'in vitro' pathway, it is important for coagulation testing.

2) Extrinsic pathway

The extrinsic pathway is largely an 'in vivo' pathway and accounts for majority of 'in vivo' coagulation. It may also be activated 'in vitro' also.

i) *'In vivo ' activation :-* `in vivo' activation occurs by the expression of tissue factor at the sites of tissue injury. *In vitro' activation :-* 'in vitro' activation occurs by exposure of blood to thromboplastin reagents (tissue factor) derived from tissues.

196. Factor useful for clot stabilization?

a) X

b) XI

c) XII

d) XIII

Correct Answer - D
Ans. is `d i.e., XIII
Factor XIII:

- It is also called fibrin stabilizing factor.
- It is necessary for clot stabilization and the cross linking of the fibrin polymer in blood.
- A hallmark of this rare deficiency is poor wound healing and abnormal scar formation.

197. Foamy macrophage is formed by -

a) LDL

b) HDL

c) Oxidized LDL

d) Oxidized HDL

Correct Answer - C
Ans. is 'c' i.e., Oxidized LDL
Foam cells are lipid laden cells that derive predominantly from macrophages, but smooth muscle cells can also imbibe lipid to become foam cells.
Macrophages and endothelial cells generate oxygen free radicals that induce chemical change in LDL to yield **oxidized (modified) LDL.**
Oxidized LDL has following effects ?
1) Ingested by macrophages through the scavenger receptor, distinct from LDL receptors, thus forming foam cells.
2) Increases monocyte accumulation in lesions.
3) Stimulates release of growth factors and cytokines.
4) Is cytotoxic to smooth muscle cells and endothelial cells. o Oxidized LDL form the core of the atheromatous plaque.

198. All of the following are features of stem cells except?

a) Found in yolk sac

b) Found in peripheral circulation

c) Used in gene therapy

d) Some stem cells are unipotent

Correct Answer - C
Ans. is 'c' i.e., Used in gene therapy
Important uses of stem cells are :?
1) The **most important use of** human stem cells is generation of cells and tissues that could be used for **cell-based therapies.** Stem cells, directed to differentiate into specific cell types, offer the possibility of a renewable source of replacement cells to treat diseases including **parkinsonism, Alzheimer's disease, spinal cord injury, diabetes, osteoarthritis, RA, and heart diseases.**
2) Stem cells are used as **bone marrow transplantation** in various types of leukemia and lymphoma.
3) Other uses are *production of knockout mice,* to test new drugs and to treat cancer and birth defects. o The sources of stem cells (for their use) are *bone marrow, adipose tissue, blood* and *umbilical cord.*

- Stem cells may be multipotent or unipotent.
- Stem cells are found in peripheral blood, yolk sac, liver and bone marrow.

199. Which of the following about totipotent stem cells is true?

a) Can differentiate into embryonic tissues

b) Can differentiate into extraembryonic tissues

c) Are descendants of pluripotent stem cells

d) Both a and b

Correct Answer - D
Ans. is 'd' i.e., Both a and b
Potency of stem cells is the potential to differentiate into different cell types :-
i) Totipotent stem cells - These cells are produced from fertilization of sperm and ovum and cells that are produced by first few division after fertilization are also totipotent. These cell can differentiate into all the tissues of embryonic or extraembryonic cell types.
ii) Pluripotent stem cells - These are descendants of totipotent stem cells and can differentiate into cells derived from any of the three germ layers.
iii) Multipotent stem cells - These cells can differentiate only into cells of a closely related family, e.g. **hematopoietic stem cells** differentiate into **RBC,** WBC, platelets but not into other types.
iv) Unipotent stem cells - Can differentiate only in to one cell type (e.g. muscle stem cell), but have property of self-renewal which distinguiches them from non-stem cells.

200. Stem cells are located in which of the following location in the body?

a) Retina

b) Endometrium

c) Intestine

d) Choana

Correct Answer - C
Ans. is 'c' i.e., Intestine
Stem cells are located in sites called *niches.* These include :
Epidermal stem cells located in the bulge area of the hair follicle serve as a stem cells for the hair follicle and the epidermis.
Intestinal stem cells are located at the base of a colon crypt, above Paneth cells.
Liver stem cells (commonly known as *OVAL cells)* are located in the canals of Hering , structures that connect bile ductules with parenchymal hepatocytes.
Corneal stem cells are located in the limbus region, between the conjunctiva and the cornea
The bone marrow contains *hematopoietic stem cells* as well as stromal cells capable of differentiation into various lineages.

201. Normal leucocyte count is ?

a) 8000 -15000

b) 4000 - 11000

c) 5000 - 8000

d) 7000 -14000

Correct Answer - B

Ans. is 'b' i.e., 4000 - 11000

- The normal range of leucocytes is 4000 - 11000 white blood cells per microliter.
- Of these, Neutrophils form 50 - 70%, lymphocytes 20 - 40%, monocytes 2 - 8%, eosinophils 1 -4%, basophils 0.4%.

202. Pain relief in acupuncture is mediated by ?

a) Endogenous opioids

b) Kinins

c) Substance P

d) PGs

Correct Answer - A
Ans. is 'a' i.e., Endogenous opioids
Question is straight and simple. Among the given options, only endogenous opioids are analgesic. Other three are pain producings substances.
"*The effects of acupuncture are mediated partly by the endogenous opioid system"*
Key concept in health phychology.
Needling during acupuncture activates high threshold receptors and/or their afferents (A-delta and C).
These generates segmental and extrasegmental modulation of nociceptive inputs.
The mechanisms of pain relief are :-
i) Activation of descending pain inhibitory pathways.
ii) Release of endogenous opioids.
iii) Positive feedback neural circuitry in the mesolimbic region of the brain.
Acupuncture also affects autonomic nervous system.

203. Most common cause of Cushing's syndrome is?

a) Pitutary adenoma

b) Adrenal adenoma

c) Adrenal carcinoma

d) McCune Albright syndrome

Correct Answer - A
Ans. is 'a' i.e., Pitutary adenoma
ACTH-secreting pituitary adenomas account for approximately 70% of cases of endogenous hypercortisolism (Cushing's syndrome).

204. Cytokine for activating macrophage and converting to epitheloid cell or giant cell ?

a) IL2

b) IL 17

c) TNF alpha

d) IFN gamma

Correct Answer - D
Ans. is 'd' i.e., IFN gamma
Granulomatous inflammation is a form of chronic inflammation characterized by collections of activated macrophages, often with T lymphocytes, and sometimes associated with central necrosis.
These granulomas are type IV hypersensitivity reaction that involves CD4-helper T-cells.
Helper T-cells are activated by IL-2 and produce IFN-y (interferon gamma) the major cytokine of granulomatous inflammation.
IFN-y induces formation of granuloma by conversion of activated macrophages into epitheloid cells and formation of giant cells by fusion of epithelial cells.

205. Normal upper limit of CA - 125 is ?

a) 25 U/ ml

b) 45 U/ ml

c) 65 U/ ml

d) 85 U/ ml

Correct Answer - A

Ans. is `a' i.e., 25 U/ ml

The normal value is less than 35 U/mL

1) Carcinoembryonic antigen (CEA)

- It is a glycoprotein produced by fetal gut, pancreas and liver.
- It is used as tumor marker for colorectal cancer (major use), *lung cancer, breast cancer and ovarian cancer.* It is also increased in non-neoplastic conditions like *alcoholic cirrhosis, hepatitis, IBD (CD, UC), smoking and pancreatitis.*
- In colorectal cancer it is used for screening; *response and follow up after surgery* (CEA *should diseapper in 6 weeks after resection), prognosis (higher levels suggests high tumor burden)* and *to see recurrence on follow up.* CEA antigen has no correlation with hepatic metastasis.
- *CEA lacks sensitivity as well as specificity, hence cannot be used to confirm the diagnosis.*

2) Alpha-feto protein (AFP)

- It is a glycoprotein synthesized normally early in fetal life by yolk sac, fetal liver and fetal GIT. *It is structurally and genetically related to albumin.*
- AFP is raised in *liver cancer (hepatocellular carcinoma), lung carcinoma, pancreatic carcinoma, colon carcinoma,* and *non-seminoma germ cell tumor of testis/ovary* (yolk sac

tumor/endodermal sinus tumor, *embryonal carcinoma, teratoma).*

- AFP is also raised in some non-neoplastic conditions like *cirrhosis, hepatitis, and pregnancy.*

3) Human chorionic gonadotropin (HCG)

- It is a placental hormone synthesized by syncytiotrophoblasts. It is glycoprotein with two subunits (dimer) : *a-subunit and /3-subunit. But only the P subunit of HCG is typically measured as a tumour marker because of specificity of the* 13 *subunit.* The i3 subunit of HCG has unique sequences that are not shared with other human glycoprotein hormones.
- It is detected by radioimmunoassay using antibodies to the 13 chain. a-HCG is not used as tumour marker because a unit of the FSH, LH and TSH are identical. So there can be cross reactivity between a subunits of these hormone. That is why in case of testicular tumours the patients also undergo simultaneous assay of LH to be certain that the marker detected is 13 HCG.
- HCG (13-HCG) is raised in *gestational trophoblastic disease (hydatidiform moles), gonadal germ cell tumor (embryonal carcinoma, choriocarcinoma), and pregnancy.*

4) CA-125

- Most important cancer with elevated CA-125 is *epithelial ovarian cancer.* CA-125 is also elevated in cancers of *endometrium, cervix,* fallopian tubes, pancreas, breast, lung and colon.
- Non-neoplastic conditions causing elevation of CA-125 are pregnancy, mensturation, *endometriosis,* PID, *abdominal TB,* peritonitis and uterine fibroid.

Tumor markers for testicular/ovarian tumor

1. *AFP (alpha-feto protein) : Teratoma, Yolk sac tumor (endodermal sinus tumor),* embryonal carcinoma.
2. *HCG (human chorionic gonadotrophin):* Choriocarcinoma, embryonal carcinoma.
3. *a,-antitrypsin :* Yolk sac tumor (endodermal sinus tumor).
4. *Placental alkaline phosphatase : Seminoma.*
5. *Other :* Placental lactogen, *LDH.*

206. White infarct is seen in -

a) Lung

b) Intestine

c) Liver

d) Ovary

Correct Answer - C
Ans. is 'c' i.e., Liver
1) Red infarcts (haemorrhagic infarcts) :- It occurs in *ovary (venous occlusion due to torsion),* lung (loose tissue) and *small intestine.* It has *well defined hemorrhagic red margins* which later become brown.
2) Pale infarct/white infarct (anemic infarct) :- It occurs in solid orgnas like *heart, spleen, liver, kidney,* and *brain.* It has *ill defined pale margins.*

207. Which of the following is not seen in Tuberous sclerosis ?

a) Shagreen patch

b) Adenoma sebacecum

c) McCollon Plaques

d) Depigmented nevi

Correct Answer - C
Ans. is 'c' i.e., McCollon Plaques

208. Gene affected in Ewings sarcoma is ?

a) EWS-FLI 1

b) PAX 3

c) EWS ATF 1

d) FUS-CHOP

Correct Answer - A
Ans, is 'a' i.e., EWS FLI 1

209. Which of the following matches is incorrect ?

a) Aromatic amines bladder cancer

b) Schistosomiasis bladder cancer

c) Benzene Leukemia

d) Nitrates Skin cancer

Correct Answer - D
Ans. is `d' i.e., Nitrates - skin cancer
"Human papilloma virus is the most common etiological factor for cervical cancer."
Environmental factors in cancer

- There is strong correlation between environmental and geographic factors in carcinogenesis.
- Environmental factors are *generally held responsible for 80-90% of all human cancers.*

210. Most common ovarian tumor in young lady is ?

a) Dysgerminoma

b) Ovarian Mucinous Cystadenocarcinoma

c) Ovarian Serous Cystadenocarcinoma

d) Fibroid

Correct Answer - A
Ans. is 'a' i.e., Dysgerminoma
Dysgerminoma is the ovarian counterpart of testicular seminoma.
Dysgerminomas account for about 2% of ovarian cancers and roughly 50% of malignant ovarian germ cell tumors.
They may occur in childhood, but 75% occur in the second and third decades of life.
They are usually unilateral.
All dysgerminomas are malignant.
They are extremely radiosensitive.

211. Ring chromosome is a result of?

a) Deletion

b) Inversion

c) Duplication

d) Translocation

Correct Answer - A
Ans. is 'a' i.e., Deletion
Ring chromosome

- *A ring chromosome* is a special form of deletion.
- It is produced when a break occurs at both ends of a chromo- some with fusion of the damaged ends.
- If significant genetic material is lost, phenotypic abnormalities result.
- This might be expressed *as 46,XY,r (14).*
- Ring chromosomes do not behave normally in meiosis or mitosis and usually result in serious consequences.

212. Which of the following bone grafts have osteogenic properties ?

a) Calcium sulphate

b) Calcium triphosphate

c) Demineralized bone matrix

d) Bone marrow aspirate

Correct Answer - D
Ans. is **'d' i.e.,** Bone marrow aspirate

213. Pseudohypertrophy is seen in ?

a) Duchenne muscular dystrophy

b) Fascio scpulohumeral dystrophy

c) Emery Dreifuss muscular dystrophy

d) Myotonic dystrophy

Correct Answer - A

Ans. is 'a' i.e., Duchene muscular dystrophy

Duchene muscular dystrophy

- Boys with Duchenne muscular dystrophy are normal at birth. Very early motor milestones are met, but walking is often delayed.
- The first indications of muscle weakness are clumsiness and inability to keep up with peers. Weakness begins in the pelvic girdle muscles and then extends to the shoulder girdle
- Enlargement of the muscles of the lower leg associated with weakness, *termed*

214. HLA B51 is associated with ?

a) Behcet's disease

b) Chrug strauss syndrome

c) Microscopic polyangitis

d) Polyarteritis nodosa

Correct Answer - A
Ans. is 'a' i.e., Behcet's disease
Behcet's disease :?

- Behcet disease is a small- to medium-vessel neutrophilic vasculitis that classically presents as a clinical triad of recurrent oral aphthous ulcers, genital ulcers, and uveitis.
- There can also be gastrointestinal and pulmonary manifestations, with disease mortality related to severe neurologic involvement or rupture of vascular aneurysms. There is an association with certain HLA haplotypes (HLAB51, in particular)

215. Increased vascular permeability in acute inflammation is due to ?

a) Histamine

b) IL 2

c) TGF beta

d) FGF

Correct Answer - A
Ans. is 'a' i.e., Histamine

216. Warthin's tumor is ?

a) Multifocal and bilateral

b) Multifocal and unilateral

c) Unifocal and bilateral

d) Unifocal and unilateral

Correct Answer - A
Ans. is 'a' i.e., Multifocal and bilateral

217. Adrenoleukodystrophy is ?

a) AD

b) AR

c) X linked dominant

d) X linked recessive

Correct Answer - D

Ans. is 'd' i.e., X Linked recessive

Adrenoleukodvstrophy

- Adrenoleukodystrophy is an X-linked recessive disease associated with mutations in a member of the ATP-binding cassette transporter family of proteins (ABCD1), which is involved in the transport of molecules into the peroxisome.
- In the typical form of the disease, young males present with behavioral changes and adrenal insufficiency.
- The disease is characterized by the inabil- ity to catabolize very-long-chain fatty acids (VLCFAs) within peroxisomes, resulting in elevated levels of VLCFAs in serum.

218. Which is not related to immunity ?

a) MPGN

b) PSGN

c) Diabetic nephropathy

d) IgA nephropathy

Correct Answer - C
Ans. is 'c' i.e., Diabetic nephropathy
The manifestation of chronic diabetes on kidneys is a result of the increased levels of blood glucose levels and are not immune mediated.

219. Tau protein seen in ?

a) Alzhiemer's disease

b) Lewy body dementia

c) Picks disease

d) Amylodosis

Correct Answer - A
Ans. is `a' i.e., Alzheimer's disease
<u>Alzhiemer's disease</u> :?

- There is atrophy of frontal and temporal lobes to variable extent and severity.
- The pattern of atrophy can often be predicted in part by the clinical symptomatology.
- The atrophic regions of cortex are marked by neuronal loss, gliosis, and the presence of tau-containing neurofibrillary tangles

220. Leiomyosarcoma most common age group is -

a) 20 - 40 years

b) 30 - 50 years

c) 40 - 60 years

d) 50 - 70 years

Correct Answer - C
Ans. is 'c' i.e., 40 - 60 years
Leiomyosarcomas occur both before and after menopause, with a peak incidence at 40 to 60 years of age.

221. FFP is stored at what temperature ?

a) 2 - 4degrees Celsius

b) 0 - (-25) degrees celsius

c) Below (-25) degrees Celsius

d) 2 - 10 degrees Celsius

Correct Answer - C
Ans. is 'c' i.e., Below (-25) degrees Celsius
Fresh frozen plasma must be stored in blood bank at or below -25 degrees celcius till it is thawed before transfusion.
Most of the clotting factors are stable at refrigerator temperature but factors V and VIII require temperatures less than - 25 degrees Celsius.

222. Diseases which show presence of fibrinoid necrosis are all except ?

a) SLE

b) PAN

c) SABE

d) Diabetic glomerulosclerosis

Correct Answer - D

Ans. is 'd' i.e., Diabetic glomerulosclerosis

Fibrinoid necrosis

- Fibrinoid necrosis is special form of necrosis usually seen in immune reactions involving blood vessels.
- This pattern of necrosis typically occurs when complexes of antigen and antibodies are deposited in the walls of arteries.
- Diseases with fibrinoid necrosis

1. *Malignant hypertension*
2. SLE
3. HBV
4. *PAN*
5. Henoch-scholein purpura
6. Near peptic ulcer
7. *Acute rheumatic fever (Aschoff's nodule)*
8. ABE
9. Malignancy
10. Rheumatoid arthritis

- In fibrinoid necrosis, tissue is no deposition.
- It is a fibrin like matter, which is deposited.

223. Grafting done between genetically different individuals of same species is ?

a) Autograft

b) Allograft

c) Isograft

d) Xenograft

Correct Answer - B
Ans. is b i.e., Allograft

224. The role of bradykinin in process of inflammation is

a) Vasoconstriction

b) Bronchodilation

c) Pain

d) Increased vascular permeability

Correct Answer - D
Ans. d. Increased vascular permeability

- *The role of bradykinin in process of inflammation is to increase vascular permeability.*
- *"Bradykinin increases vascular permeability and causes contraction of smooth muscle, dilation of blood vessels, and pain when injected into the skin."- Robbins 8/e p65*

Kinins

- Kinins are vasoactive peptides derived from plasma proteins, called kininogens, by the action of specific proteases called kallikreins.
- The kinin and coagulation systems are also intimately connected.
- *The activ*e form of factor XII, factor XIIa, converts plasma prekallikrein into an active proteolytic form, the enzyme kallikrein, which cleaves a plasma glycoprotein precursor, high-molecular-weight kininogen, to produce bradykinin
- Bradykinin increases vascular permeability and causes contraction of smooth muscle, dilation of blood vessels, and pain when injected into the skinQ.
- These effects are similar to those of histamine.
- The action of bradykinin is short-lived, because it is quickly inactivated by an enzyme called kininase.
- Any remaining kinin is inactivated during passage of plasma through

the lung by angiotensin-converting enzyme.

- Kallikrein itself is a potent activator of Hageman factor, allowing for autocatalytic amplification of the initial stimulus.
- Kallikrein has chemotactic activity, and it also directly converts CS to the chemoattractant product C5aQ.

225. Sequence of events in acute inflammation ?

a) Vasodilatation → Stasis → Transient vasoconstriction → Increased permeability

b) Transient vasoconstriction → Stasis → Vasodilatation → Increased permeability

c) Transient vasoconstriction → Vasodilatation → Stasis → Increased permeability

d) Transient vasoconstriction →Vasodilatation → Increased permeability → Stasis

Correct Answer - D
Ans. is 'd' i.e., Transient vasoconstriction → Vasodilatation → Increased permeability → Stasis

226. M.C. site of Ca esophagus is ?

a) Middle '/$_3$rd

b) Upper '/3rd

c) Lower '/$_3$rd

d) Lower end of esophagus

Correct Answer - C
Ans. is 'c' i.e., Lower '/$_3$rd

- Love 24th/e p. 1009] Distribution of esophageal Ca (Harrison 17thie p. 571)
  Upper 3rd → 10%
  Middle 3rd → 35%
  Lower 3rd → 5%
- Esophageal carcinoma is of two common histological types ?
  Squamous cell carcinoma
- Most common type world wide.
- Most common type in India.
- Occurs in upper and middle '/3rd of esophagus.
  Adenocarcinoma
- Most common type in USA.
- Located in the lower J/3rd of esophagus.

227. The sign of reversible injury in a case of alcoholoic liver disease

a) Loss of cell membrane

b) Nuclear karyolysis

c) Cytoplasmic vacuole

d) Pyknosis

Correct Answer - C
Ans. is 'c' i.e., Cytoplasmic vacuole

228. Gilbert syndrome, true all except ?

a) Causes cirrhosis

b) Autosomal dominant

c) Normal liver function test

d) Normal histology

Correct Answer - A
Ans. is 'a' i.e., Causes cirrhosis
Gilbert's Syndrome: *?*

- o It is an autosomal dominant condition.
- o It is characterized by unconjugated hyperbilirubinemia (normally the bilirubin is transported into liver cells by intracellular proteins. In the liver bilirubin is conjugated. This conjugation is brought about by certain enzymes. In Gilbert's syndrome these enzymes are absent which cause unconjugated hyperbilirubinemia).
- The hyperbilirubinemia is usually precipitated by following conditions – Stress, Fatigue, Alcohol use, reduced calorie intake, intercurrent illness.
- The hepatic biochemical tests are normal except for elevated bilirubin level (serum bilirubin concentration are usually < 3mg/dl)

Embryonal carcinoma The hepatic histology is normal
There is no association with cirrhosis.

229. Parents are carrier of an autosomal recessive disorder. Chances of offspring to get affected?

a) 1 : 1

b) 1 : 2

c) 1 : 3

d) 1 : 4

Correct Answer - D
Ans. is `d' i.e., 1:4

- If both parents are carrier, there are 25% chance (1 in 4) that the child will be affected.

230. Bilateral hilar lymphadenopathy with non caseating granuloma is seen in ?

a) TB

b) Lymphoma

c) Sarcoidosis

d) All of the above

Correct Answer - C
Ans. is 'c' i.e., Sarcoidosis

231. Perifascicular atropy of muscle fibres is seen in?

a) Steroid myopathy

b) Dermatomyositis

c) Inclusion body myositis

d) Nemaline myopathy

Correct Answer - B
Ans. is 'b' i.e., Dermatomyositis

- Dermatomyositis is a connective-tissue disease related to polymyositis that is characterized by inflammation of the muscles and the skin.
- It is a systemic disorder that may also affect the *joints, the esophagus, the lungs, and, less commonly, the heart.*
- On the muscle biopsy, there are two classic microscopic findings of dermatomyositis. They are : *mixed B- & T-cell perivascular inflammatory infiltrate and perifascicular muscle fiber atrophy.*
- It is associated with autoantibodies, especially *anti-Jol antibody.*

232. ANCA associated with Wegner's granulomatosis?

a) cANCA

b) pANCA

c) Both

d) None

Correct Answer - A
Ans. is 'a' i.e., cANCA
Antineutrophil cytoplasmic antibodies (ANCA)

- ANCA are heterogenous group of autoantibodies directed against antigens which are found within the primary *granules of neutrophil* and in the *lysosomes of monocytes* and in EC's.
- The description of these autoantibodies is based on the immunofluorescence pattern of staining of ethanol fixed neutrophils. With immunofluorescence two principal patterns are recognized:

1. Cytoplasmic (c-ANCA):

- This shows cytoplasmic localization of the staining and the target antigen for this type of autoantibody is – *proteinase-3 (PR3), a neutrophil granule constituent.*
- *Perinuclear staining (p-ANCA):*
- This shows perinuclear staining and the target antigen here is *myeloperoxide* (MPO).
- Remember *that either of these antibodies may occur in a patient with ANCA associated small vessel vasculitis but*
- cANCA Typically found in
- Wegener's granulomatosis
- pANCA Typically found in
- Microscopic polyangiitis

- Churg-Strauss syndrome
- Idiopathic crescentic glomerulonephritis
- Goodpasteur's syndrome.
- pANCA's are also associated with certain non-vasculitic entities such as certain rheumatic and nonrheumatic autoimmune diseases, Inflammatory bowel diseases, certain drugs, infections such as endocarditis and
- bacterial airway infection in patients with cystic fibrosis.

233. HLA associated with psoriasis ?

a) **HLA-B27**

b) **HLA-DR4**

c) **HLA-CW6**

d) **HLA-B8**

Correct Answer - A
ans. is 'a' i.e., HLA B27 *[Ref: Various books]*
"HLA B27 is also associated with GPP (generalized pustular psoriasis)"
`A link has been found between acute generalized pustular psoriasis and HLA B27."

234. DIC is common in which AML -

a) Nonocytic **(M_5)**

b) Promyelo cytic (M3)

c) Erythrocytic (M_6)

d) Megakaryocytic **(M7)**

Correct Answer - B
Ans. is 'b' i.e., Promyelocytic

- Tumor cells in acute promyelocytic leukemia (M_3) release procoagulant and fibrinolytic factors that cause disseminated intravascular coagulation (DIC).

235. Example ofApoptosis is?

a) Councilman Bodies

b) Gamma Gandy Body

c) Russell bodies

d) None

Correct Answer - A
Ans. is 'a' i.e., Councilman bodies
Apoptotic body

- One of the murphological hallmark of apoptosis is the apoptotic body which is eosinophilic and may contain some karryorhectic nuclear bebris.
- It is a result of shrinkage of cytoplasm and nuclear disruption.
- First there is surface blebbing and margination of chromatin which is followed by cell shrinkage and breakup into smaller apoptotic bodies.
- These apoptotic bodies are taken up by surrounding cells and digested.
- Since the process was seen for a long time before the mechanism was understood, apoptotic bodies in particular situations attracted specific names:

1. Civatte bodies or colloid bodies in lichen planus.
2. Kamino bodies in melanocytic lesions
3. Councilman bodies in acute viral hepatitis
4. Tingible bodies (founds in macrophages) in lymphoma
5. Sunburn cells
6. Satellite dyskeratotic cells
7. Eosinophilic globules

236. Fibrinoid necorsis with neutrophilic infiltration is seen in ?

a) PAN

b) Giant cell arteritis

c) Takayasu arteritis

d) Wegener's granulomatosis

Correct Answer - A
Ans. is 'a' i.e., PAN

237. HLA associated with rhaumatoid arthritis ?

a) HLA-B27

b) HLA-DR4

c) HLA-CW6

d) HLA-B8

Correct Answer - B
Ans. is 'b' i.e., HLA-DR4

238. Concentric hypertrophy of left ventricle is seen in?

a) Mitral stenosis

b) Hypertension

c) Aortic regurgitation

d) None

Correct Answer - B

Ans. is 'b' i.e., Hypertension

- Concentric hypertrophy —> In pressure overload, e.g. hypertension and aortic stenosis. o Eccentric hypertrophy → In volume overload, e.g. in aortic regurgitation.

Adaptations in heart

- The cardiac myocyte is terminally differentiated cell that is not able to divide.
- Myocardium cannot undergo hyperplasia, i.e. increase in the number of myocyte.
- So, myocardium can adapt by increasing the size (i.e. hypertrophy) of the myocyte in response to stress.
- There are two types of stresses to heart

1. Pressure overload

- Occur in hypertension or aortic stenosis.
- Pressure overloaded ventricles develop concentric hypertrophy of the left ventricle, with increased in wall thickness → Heart size may increase.
- The increase in wall thickness may reduce the cavity diameter --> ratio of cavity size to wall thickness decreases.
- There is increase in the transverse diameter (width) of myocytes, but cell length remains the same.

2. Volume overload

- As occurs in aortic regurgitation
- There is dilatation of ventricular chamber along with increased thickness of ventricular wall→ Eccentric hypertrophy.
- There is increase both in the transverse diameter (width) and the length of myocytes.
- It is due to deposition of the sarcomeres (functional intracellular contractile unit of cardiac muscles) in parallel to the long axis of cells.

239. Which of the following is responsible for adhesion of plate¬lets to the vessel IN all?
(.4//MS May 2015, November 2013

a) Factor IX

b) Von Willebrand factor

c) Fibrinogen

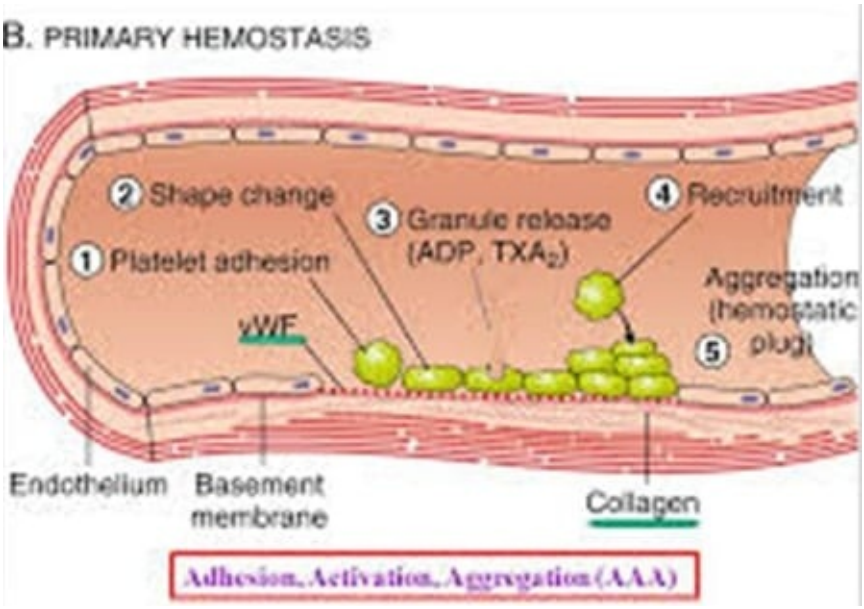
d) Fibronectin

Correct Answer - B
Ans: B. Von Willebrand factor
(Ref. Robbins 9/e pill), 660 & Robbins 9/e p116
Von-Willebrand factor:

- Product of normal endothelial cells.
- An essential cofactor for platelet binding to matrix elements (adhesion of platelets to vessel wall).

Events:

- **E**ndothelial injury allows platelets to contact underlying extracellular matrix à subsequent adhesion occurs through interactions with von Willebrand factor (vWF).


B. PRIMARY HEMOSTASIS
2 Shape change
3 Granule release (ADP, TXA_2)
4 Recruitment
1 Platelet adhesion
Aggregation (hemostatic plug)
5
vWF
Endothelium
Basement membrane
Collagen
Adhesion, Activation, Aggregation (AAA)

240. Lymphatic spread is most commonly seen in which type of thyroid malignancy:

a) Papillary carcinoma

b) Follicular carcinoma

c) Medullary carcinoma

d) Anaplastic carcinoma

Correct Answer - A

Ans: A. Papillary carcinoma

Papillary Carcinoma of Thyroid:

- MC thyroid cancer in children and individuals exposed to external radiation

Multifocality:

- Common (up to 85% of cases) on microscopic examination.

Metastates:

- Lymph node metastases – Common especially in children and young adults.
- Distant metastases - Uncommon initially.
- Ultimately develop in 20% patients.
- Associated with an increased risk of cervical nodal metastases, rarely invade adjacent structures such as the trachea, esophagus & RLNs.

"Lateral aberrant thyroid":

- Denotes invaded cervical lymph node by metastatic cancer.

241. Antibody dependent killing:

a) NK cell

b) NK cell only

c) Macrophage

d) NK cells, neutrophils & macrophage

Correct Answer - D
Ans: D. NK cells, neutrophils & macrophage
Ref: Robbins and Cotran Pathologic Basis of Disease edn; Page no. 784

- Antibody depended cell-mediated cytotoxicity (ADCC) is the killing of an antibody-coated target cell by a cytotoxic effector cell through a nonphagocytic process, characterised by release of content of cytotoxic granules Tor by expression of cell death-inducing molecules.
- ADCC is triggered through interaction of target bound antibodies (IgA, IgG or IgE) with certain Fc receptors, glycoproteins present on the effectors cell surface that binds the Fc region of Ig.
- Effector cells that mediate ADCC include NK Cells, monocytes, macrophages, neutrophils, eosinophils and dendrite cells.

242. Serum sickness is:

a) Type 1 hypersensitivity reaction

b) Type 2 hypersensitivity reaction

c) Type 3 hypersensitivity reaction

d) Type 4 hypersensitivity reaction

Correct Answer - C
Ans: C. Type 3 hypersensitivity reaction
(Ref: Robbins 9/e p207)

- Serum sickness is the prototype of a systemic immune complex disease or type III hypersensitivity reaction.

Immune Complex—Mediated (Type III) Hypersensitivity:

- Acute serum sickness is the prototype of a systemic immune complex disease; it was once a frequent sequela to the administration of large amounts of foreign serum (e.g., serum from immunized horses used for protection against diphtheria).

243. Which of the following pathway is seen in basal cell carcinoma

a) mTOR

b) Sonic Hedgehog

c) WNT

d) RAS

Correct Answer - B
Answer- B. Sonic Hedgehog
Basal cell carcinoma
Locally aggressive tumor

- Associated with mutations which activate Hedgehog pathway signalling.
- Gorlin syndrome is associated with gene PTCH, a tumor suppressor gene
- PTCh is receptor for Sonic hedgehog, which determines polarity during embryonic development.
- Basal cell carcinoma presents as pearly papules.

244. Classical pathway macrophage activating molecule

a) IFN gamma

b) IL 4

c) IL 13

d) ILI

Correct Answer - A
Answer- A. IFN gamma

- There are two major pathways of macrophage activation:
- Classical macrophage activation- induced by microbial products, which engage toll like receptors & other sensors, by T cell derived signals, importantly the cytokine IFN-y
- Alternative macrophage activation - induced by cytokines III & ILl3 produced by T lymphocytes & other cells. Their main function is tissue repair & secrete growth factors which cause angiogenesis, activate fibroblasts & stimulate collagen synthesis.

245. T11/2 of Haptoglobin complex is

a) 5 days

b) 3 days

c) 10 days

d) 10 minutes

Correct Answer - D
Answer- D. 10 minutes

- Hemoglobin-haptoglobin complexes are rapidly cleared from circulation via monocytes and tissue macrophages via CDl63 receptors 15.
- Free haptoglobin has a half-life of 5 days, whereas hemoglobin-haptoglobin complexes have a half-life of l6minutes.

246. Free radical scavanging system enzyme is

a) NADPH oxidase

b) Glutathione peroxidase

c) Endonuclease

d) Phospholipase

Correct Answer - B
Answer-B. Glutathione peroxidase
Antioxidant mechanisms
1. Non-enzymatic system

- Antioxidants (Vit E , Vit A, Vit C, glutathione and Cysteine)
- Tissue proteins (transferrin, ferritin, laetofeftifl, and ceruloplasmin).

2. Enzymatic system

- Catalase
- Supuoxide damutase (SOD)

3. Glutathione peroxidase

- Present in mitochondria & cytosol.
- It catalyzes free radical breakdown.

$H_2O_2 + 2\ G\ S\ H \rightarrow G\ S\ S\ G + 2\ H_2O$
$2OH + 2\ G\ S\ H \rightarrow G\ S\ S\ G + 2H_2O$

247. Alpha-1 antitrypsin acts to prevent lung tissue destruction by

a) Inhibiting the release of trypsin

b) Inhibiting the activation of trypsinogen

c) Inhibiting the release of chymotrypsin

d) Inhibiting the elastase of neutrophils in lung

Correct Answer - D
Answer- D. Inhibiting the elastase of neutrophils in lung
The most accepted theory in the pathogenesis of emphysema is protease - antiprotease mechanism which is responsible in the pathogenesis of two common forms of emphysema, i.e. centriacinar and panacinar.
A) Pathogenesis of panacinar emphysema

- Panacinar emphysema is associated wlth congenital deficiency of alpha 1-antitrypsin.
- Neutrophil are the major cell in the pathogenesis of panacinar emphysema.

B) Pathogenesis of centriaginar emphysema in centriacinar emphysema, both neutrophils and macrophages play central role.

248. Which of the following collagen is involved/expressed in early wound healing

a) Type 1

b) Type 2

c) Type 3

d) Type 4

Correct Answer - C
Answer- C. Type 3

- In wound healing earliest collagen to be deposited is type - 3 collagen along with fibronectin. Their deposition starts within l0 hours to 3 days and deposition peaks between 1 to 3 weeks.
- Later type - 3 collagen is replaced by type I collagen, which is more stronger.

249. Misfolding of protein is associated with all of the following diseases in human, except

a) Alzheimer's disease

b) Bovine spongiform encephalopathy

c) Scrapie disease

d) Parkinson's disease

Correct Answer - C
Answer- C. Scrapie disease
Scrapie disease occurs in animals.
Prion proteins-

- Creutzfeldt - Jakob disease (CID)
- Fatal familial insomnia
- Gerstmann-straussler-scheinker (GSS) svndrome
- Kuru

250. Leber hereditary optic neuropathy ELHUNI is caused by mutation in

a) Mitochondrial DNA

b) Nuclear DNA

c) Non-coding DNA

d) DNA dependent ribonucleosomes

Correct Answer - A
Answer- A. Mitochondrial DNA

- Mitochondrial DNA is the only non-chromosomal DNA in human cells. Mitochondrial DNA is always maternally inherited.
- Thus diseases caused by mutation in mitochondrial DNA are always inherited from mother to next generation.
- All children from affected mother will inherit the disease but it will not be tranmtitted from an affected father to his children

251. Which of the following causes vasoconstriction in all vascular beds

a) PGE2

b) PGF 2a

c) PGI2

d) TXA2

Correct Answer - D
Answer- D. TXA2
COX pathway is involved in the synthesis of prostaglandins and Thromoxane A2.

- Endothelium contains PGI2 synthase and thus forms PGI2
- Platelets contain TXA2 synthase and therefore synthesize TXA2

Blood vessels- Thromboxane A2 (TXA2)

252. Which of the following is autosomal dominant

a) Duchene muscular dystrophy

b) Cystic fibrosis

c) Myotonic dystrophy

d) Ataxia telengiectasia

Correct Answer - C
Answer-C. Myotonic dystrophy

- X-linked recessive disorders- Duchene muscular dystrophy (musculoskeletal)
- Autosomal recessive disorder-Cystic fibrosis (musculoskeletal)
- Autosomal recessive disorder- Ataxia telengiectasia (nervous)
- autosomal dominant disorder- Myotonic dystrophy (nervous)

253. E-cadherin mutation is seen in metastasis of which type of breast carcinoma

a) Infiltrative ductal Ca

b) Lobular Ca

c) Metaplastic Ca

d) Medullary Ca

Correct Answer - B
Answer- B. Lobular Ca

- Mutation in gene encoding for E-cadherin (CDH-I) is associated with gastric carcinoma and lobular breast carcinoma.
- Detachment of tumor cells is thefrst step tn metastasis. Normally cells are glued to each other by adhesion molecules
- E-cadherin. Normal function of E-cadherin is dependent on catenins that helps in linkage of cytoskeleton to E-cadherin.
- Down regulation of expression of either E cadherins or catenins results looseining of cells that helps ln metastasis.

254. Which of the following group represents negative acute phase proteins

a) Transferrin, albumin, transthyretin

b) Haptoglobulin, CRP, albumin

c) Haptoglobulin, ceruloplasmin, fibrinogen

d) CRP, a-1 antitrypsin, fibrinogen

Correct Answer - A
Answer- A. Transferrin, albumin, transthyretin
Acute phase reaction (acute phase response)-
1. Positive acute phase proteins

- Important examples are C-reactive protein : CRP (Beta 1- globulin), alpha-l antitrypsin,fbrinogen, feftitin, serum amyloid A, hepatoglobulin, ceruloplasmin, and alpha-2 microglobulin.

2) Negative acute phase proteins

- Important examples are albumin, prealbumin, transferrin, transcortin, transthyretin and retinal binding protein.

255. Antibodies against phospholipase A2 receptors are seen in

a) Membranous GN

b) Membrano proliferative GN

c) Minimal change disease

d) Focal segmental glomerulosclerosis

Correct Answer - A
Answer- A. Membranous GN

- Membranous glomerulonephritis, also known as membranous nephropathy, is a slowly progressive disease of the kidney.
- Primary (also called idiopathic) membranous nephropathy is considered to be an autoimmune disease linked to certain HLA alleles such as HLA-DQA1 and caused in most cases by antibodies to a renal autoantigen. In many adult cases the autoantigen is the phospholipase A2 receptor.

256. A 55 years old female patient is presenting with excessive menstrual blood loss and fecal blood loss. The diagnosis is

a) Gardner syndrome

b) Turcot's syndrome

c) Lynch syndrome

d) None of the above

Correct Answer - C
Answer- C. Lynch syndrome
Lynch syndrome is characterized by colorectal, endometrium and ovarian carcinomas.
Hereditary non-polyposis colorectal cancer (HNPCC) syndrome

- It is also known as Lynch syndrome. It is characterized by increased incidence of colorectal cancer and extraintestinal cancers (ovary and endometrium).
- There is mutation in MSH2 and MLH1 genes required for DNA repair. This causes mictosatellite instability.
- Colon cancer in these patients affect ascending (right) colon.

257. Sjogren syndrome is characterized by all except

a) Keratoconjunctivitis sicca

b) Excessive salivation

c) Splenomegaly

d) Lymphoma

Correct Answer - B
Answer- B. Excessive salivation
Sjogren syndrome is a chronic disease characterized by dry eyes (keratoconjuctivitis sicca) and dry mouth (xerostomia) resulting from immunological mediated destruction of the lactimal and salivary gland.

Extraglandular

- Raynaud's phenomenon
- Vasculititis
- Arthralgia/Arthritis
- Lymphadenopathy
- lymphoma
- Splenomegaly

Lung involvement

- Kidney involvement
- Peripheral neuropathy

Myositis

- Liver involvement

258. Durck granuloma is seen in

a) Brain

b) Spleen

c) Liver

d) Lymphnode

Correct Answer - A
Answer- A. Brain

- The major pathogenic mechanism of cerebral malaria is the sequestration of RBCs in cerebral vessels where they interfere with microcirculatory flow and metabolism.
- The softened areas are invaded by glial cells forming the so-called "malarial granulomas' of durck result of a reparative reaction to local damage.

259. Liver biopsy in malaria will show -

a) Microabscesses

b) Kupffer cell hyperplasia

c) Piecemeal necrosis

d) Non caseating granuloma

Correct Answer - B
Answer-B. Kupffer cell hyperplasia
Microscopic findings of liver in malaria-

- The kupffer's cells are increased in number and their cytoplasms are filled with malarial pigment (haematin) and parasitised erythrocytes.
- The parenchyma cells ofthe liver lying in the central zone show fatty degeneration, atrophy and necrosis.
- Fibrous tissue is not increased to any great extent.

260. Zellballen pattern on histopathology is observed in?

a) GIST

b) Astrocytoma

c) Carotid body tumor

d) Retinoblastoma

Correct Answer - C
Answer-C. Carotid body tumor
Paraganglioma are clusters of neuroendocrine cells (glomus cell) associated with the sympathetic and parasympathetic nervous system.
Microscopic features of Paraganglioma are:

- l. Composed of nests(zellballen) of round to oval chief cells (neuroectodermal origin)that are surrounded by delicate vascular septa.

261. Zellballen pattern is seen in

a) Paragangliomas

b) Pheochromocytom

c) Carotid by tumor

d) All of the above

Correct Answer - D
Answer- D. All of the above

262. Salivary gland tumor exclusively seen in parotid gland

a) Warthin's tumor

b) Pleomorphic adenoma

c) Mucoepidermoid Ca

d) Adenoid cystic Ca

Correct Answer - A
Answer-A. Warthin's tumor

- "Warthin's tumor arises only in the parotid gland" - Textbook of surgery
- "Warthin's tumor arises almost exclusively in the parotid gland (the only tumor virtually restricted to the parotid)"
- Salivary gland tumor seen only it parotid gland- Warthins'tumor.

263. Myositis ossificans is an example of

a) Hypertrophy

b) Hyperplasia

c) Metaplasia

d) Both hyperplasia & hypertrophy

Correct Answer - C
Answer- C. Metaplasia
Metaplasia is a reversible change in which one differentiated cell type is replaced by another differentiated cell type
l. Epithelial metaplasia
2. Connective tissue metaplasia

- This transformation occurs between the mesodermally derived tissues i.e., one type of connective tissue is replaced by another type ofconnective tissue.
- This is characterized by conversion of fibroblast - derived soft tissue into muscle, Cartilage or bone.
- Example - Bone formation in muscle i.e., myositis ossificans.

264. Alpha-fetoprotein is a tumor marker for

a) Hepato cellular carcinoma

b) Multiple myeloma

c) Seminoma

d) Breast carcinoma

Correct Answer - A
Answer- A. Hepato cellular carcinoma
Alpha-feto protein (AFP)

- AFP is a well estabilished tumor marker
- It is a glycoprofein synthesized normaily early in fetal life by the yolk sac, fetal liver and fetal GIT.

AFP is raised in -

- Carcinomas > Liver Ca, Lung Ca, Colon Ca, Pancreatic Ca, Non-seminoma germ cell tumor of testis.
- Non-neoplastic conditions > Cirrhosis, Hepatitis, Pregnancy

265. Irreversible injury to myocardium in MI occurs earliest by

a) Few seconds

b) 10 minutes

c) 20 minutes

d) 40 minutes

Correct Answer - C
Answer- C. 20 minutes

- hlyocardial function is more seflsith'e to kchemia (loss of contractility occurs within 60 seconds) than myocardial structure
- (irreversible injury occurs in 2O-40 minutes), thus myocardial necrosis begins at approximately 30 minutes after coronary occlusion

266. Calcium dependant cell adhesion molecule is

a) Cadherin

b) ICAM-1

c) L-selectin

d) Integrin

Correct Answer - A
Answer- A. Cadherin

- The cadherins are calcium-ilependent adhesion molecules. The three most common cadherins are neural (N)-cadherin, placental (P) cadherin, and epithelial (E)-cadherin. All three belong to the classical cadherin subfamily. There are also desmosomal cadherins and proto-cadherins. Cadherins are intimately involved in embryonic development and tissue organization. They exhibit homophilic adhesion. The extracellular domain consists of several cadherin repeats, each is capable of binding a calcium ion. When calcium is bound, the extracellular domain has a rigid, rod-like structure.
- Following the transmembrane domain, the intracellular domain is highly conserved. The intracellular domain is capable of binding the alpha, beta, gamma catenins.

267. Misfolded amyloid deposition in brain is seen in

a) Creutzfeldt-jakob disease

b) Alzheimer's disease

c) HIV-encephalopathy

d) Gaucher's disease

Correct Answer - B
Answer- B. Alzheimer's disease
A Beta protein precursor (A Beta PP)-Alzheimer's disease

268. Change seen in mitochondria due to aging is?

a) Decrease in size & increase in number

b) Decrease in number & increase in size

c) Decrease in size and number both

d) Increase in size and number both

Correct Answer - C

Answer- C. Decrease in size and number both

Celluler changes-

- Decrease in cell size and number.
- Decreased in size and number of mitochondria Detachment of ribosomes from ER
- Increased number of phagolysosomal vacuoles Defective DNA repair
- Non-enzymatic glycosylation of protien

269. Which of the following is seen in hyperemia?

a) Decreased arteriolar blood flow to the tissue

b) Increased arteriolar blood flow to the tissue

c) Increased venous blood flow in the tissue

d) Decrease venous blood flow in the tissue

Correct Answer - B

Answer- B. Increased arteriolar blood flow to the tissue

- Hypermia and congestion are the terms used for increased volume of blood within dilated vessels of an organ or tissue.
- Hyperemia is an active process resulting from augmmted blood Jlow to tissue because of arteriolar dilatation, at the site of inflammation or in skeletal muscle during exercise.
- Hyperemia is one of the cardinal sign of inflammation, i.e. redness (rubor) is due to hyperemia.

270. Focal length of high power objective lens of microscope?

a) 40mm

b) 16mm

c) 20mm

d) 4mm

Correct Answer - D
Answer- D. 4mm
Approximate focal length-4mm

271. Hypercalcemia in sarcoidosis all are true except?

a) Parathormone level is increased

b) PTHrP level is increased

c) Calcitriol level is increased

d) Oral steroids are useful

Correct Answer - A

Answer- A. Parathormone level is increased

- Extrarenal synthesis of calcitriol [1,25(OH)2D3] is central to the pathogenesis of abnormal calcium metabolism in sarcoidosis.
- Sarcoidosis causes an increase in l, 25-dihydroxy vitamin D, the active metabolite of vitamin D, which is usually hydrorylated within the kidney, but in sarcoidosis patients hydroxylation of vitamin D can occur outside the kidneys, mainly inside the immune cells found in the granulomas and produces 1 alpha, 25(OH)2D3, which is the main cause for hypercalcemia in sarcoidosis.
- PTH release is inhibited by hypercalcaemia and high levels of calcitriol, so PTH level is suppressed in sarcoidosis.

272. Bronchopulmonary aspergillosis is associated with?

a) Kertagener syndrome

b) Cystic fibrosis

c) Good Pasture syndrome

d) Silicosis

Correct Answer - B

Answer- B. Cystic fibrosis

- Allergic bronchopulmonary aspergillosis (ABPA) is a condition characterized by a hypersensitivity response) to the
- Aspergillus (most commonly Aspergillus fumigatus). It occurs most often in patients vith asthma or cystic fibrosis
- ABPA causes airway inflammation, leading to brochiectasis-a condition marked by abnormal dilation of the bronchi and bronchioles.

273. Transfusion associated graft vs host disease can be prevented by?

a) Irradiation

b) Washing

c) Chemical treatment

d) All of the above

Correct Answer - A
Answer- A. Irradiation
Transfusion-associated graft -versus-host disease (TA-GvHD)

- A rare complication of blood transfusion, in which the donor T lymphocytes mount an immune response against the recipient's lymphoid tissue.
- The only currently efective method to prevent TA-GVHD is gamma irradiation of blood products prior to transfusion

274. Toll like receptors are seen on?

a) Macrophages

b) Natural killer cells

c) Endothelial cells

d) All of the above

Correct Answer - D
Answer-D. All of the above

- The Toll-like receptors are rnembrane proteins that recognize avariety of microbe-derived molecules and stimulate innate immune responses against the microbes.
- The Toll-like receptors are expressed on many different cell types that participate in innate immune responses including ,macrophages, dendritic cells, neutrophils, NKs cells, mucosal epithelial cells and endothelial cells.

275. Which is the nerve sheath tumor according to WHO?

a) Schwannoma

b) Paraganglioma

c) Medulloblastoma

d) Astrocytoma

Correct Answer - A
Answer- A. Schwannoma
Schannomos are benign tumors of the nerve sheath

- Schwannomas can arise from any peripheral nerve containing Schwann cell, including cranial nerves
- The eighth cranial nerve is the most susceptible to schwannomas. Bilateral schwannomas of the eighth cranial nerve indicate the presence of type 2 neurofibromatosis.

276. Which of the following are slow reacting substances of anaphylaxis?

a) LTB4 and C4

b) LT A4 and B4

c) LT A4 and C4

d) LT C4 and D4

Correct Answer - D

Answer- D. LT C4 and D4

- Slow-reactine substance of anaohvlaxis (SRS-A)
- A mixture of the leukotrienes LTC4, LDD4 and LTE4 are called slow reacting substances of anaphylaxis (SRS-A).
- These are the most potent mediators causing bronchospasm.
- They are produced via lipoxygenase pathway (LOX pathway) of arachidonic acid metabolism during inflammation.

277. Which tumor arises from organ of Zuckerkandl?

a) Paraganglioma

b) Schwannoma

c) Astrocytoma

d) Medulloblastoma

Correct Answer - A

Answer- A. Paraganglioma

- The organ of Zuckerkandl is a chromaffin body derived from neural crest located at the bifurcation of the aorta or at the origin of the inferior mesenteric artery.It can be the source of paraganglioma.

278. Changes in which amyloid structure makes it insoluble?

a) Primary

b) Secondary

c) Tertiary

d) Quaternary

Correct Answer - B
Answer-B. Secondary
Amyloid is a protein that has an alteration in its secondary structure which imparts it a particular insoluble form, called the beta-pleated sheet conformation.

279. Hirano bodies seen in?

a) Rabbies

b) Alzheimer's disease

c) Pick's disease

d) Viral encephalitis

Correct Answer - B
Answer-B. Alzheimer's disease

- They are intracellular, paracrystalline, eosinophilic sttwcturesoften occurring as rod shapes in the neurons ofindividuals with neuro-degenerative diseases incfuding Alzheimer's and some forms of Creutzfeldt-Jacob ilisease. They are intracellular aggregates of actin and actin-associated proteins.

280. In acute solid organ Graft vs host disease, which of the following is not seen?

a) Occurs within 100 days of transplantation

b) Skin is the most common organ involved

c) Preformed antibodies are involved

d) May lead to cholestatic jaundice

Correct Answer - C

Answer- C. Preformed antibodies are involved

- Preformed antibodies are involved in hyperacute rejection not in GVHD.
- Acute GVHD occvs within 100 days (usually 10-50 days) of bone marrow transplantation.

281. Her2/neu gene is on which chromosome?

a) 13

b) 14

c) 15

d) 17

Correct Answer - D

Answer- D. 17

- ERBB2, a known proto-oncogene, located at the long arm of human chromosome 17 (17q12)
- HER2 is a member of the human epidermal growth factor receptor (HER/EGFR/ERBB) which is plasma membrane-bound receptor tyrosine kinase.

282. Vanishing bile duct syndrome is seen in?

a) Primary sclerosing Cholangitis

b) Primary biliary cirrhosis

c) Cystic fibrosis

d) All of the above

Correct Answer - D

Answer-D. All of the above

- vanishing bile duct syndrome refers to a group ofdisorders resulting in destruction/disappearance ofthe intrahepatic bile ducts and, ultimately, cholestasis.
- Causes
- Cystic fibrosis
- Intrahepatic bile duct atresia
- Caroli's disease
- Primary sclerosing Cholangitis
- Primary biliary cirrhosis
- Hodgkin's lymphoma

283. Which of the following organ can cause antigen reaction when exposed in self blood?

a) Kidney

b) Liver

c) Eye lens

d) Platelets

Correct Answer - C

Answer- C. Eye lens

Antisen Seauestration

- Some self reactive lymphocytes cannot react against the host cells because these cells or antigens are located in the tissues which do not communicate with blood & interact with immune system during development.
- These sites are called immune privileged sites, because it is difficult to induce immune response to antigen in these sites.
- These are treated as foreign when introduced into circulation and they elicit both humoral and cellular response.

Examples of such sites are

1. Eye -lens anduvealttact
2. Testis - sperms
3. Brain

284. Most common cancer in liver is

a) Papilloma

b) Hepatic adenoma

c) Metastasis

d) Cavernous Hemangioma

Correct Answer - C

Answer- C. Metastasis

- Most commonhqtatic neoplasm is metastasis.
- Most common primary benig nlesion of liver is cavernous hemangioma.
- Most common primary malignant lesion of liver is hepatocellular carcinoma.
- Most common primary hepatic tumor of children is hepatoblastoma.

285. Which of the following is not an extra articular feature of Rheumatoid arthritis?

a) Weight loss

b) Pleural effusion

c) Conjunctivitis

d) Proteinuria

Correct Answer - D

Answer- D. Proteinuria

Extra-articular manifestations in RA

1. Systemic manifestations: Fever, weight loss, fatigue.
2. Dermatological: Subcutaneous nodule.
3. Cardio-pulmonary: Pericardial & pleural effusion, constrictive pericariditis, pulmonary fibrosis, lung nodules.
4. Eye : Sjogren syndrome (Keratoconjunctivitis sicca), scleritis.
5. Nervous : Carpal tunnel syndrome, tarsal tunnel syndrome, mononeuritis multiplex

286. All of the following are true about primary biliary cirrhosis except?

a) Portal fibrosis

b) Anti-mitochondrial antibodies

c) Elevated cholesterol level

d) Decreased lipoprotein X level

Correct Answer - D

Answer- D. Decreased lipoprotein X level

- Primary biliary cirrhosis is associated with elevated lipoprotein-X (lipoprotein-X is elevated in conditions causing cholestasis).

287. Genetic association of Diabetes?

a) MHC

b) VHL

c) CTLA4

d) PDGF-R

Correct Answer - C
Answer- C. CTLA4
Type I Diabetes

- CTLA4 (cytotoxic T lymphocyte-associated 4)- 2q3I -35

288. Low dietary fiber intake is related to which carcinoma?

a) Breast

b) Lung

c) Kidney

d) Colon

Correct Answer - D

Answer- D. Colon

- Low fibre diet
- High
- Intake of animal fat
- Smoking and alcohol
- Streptococcus bovis septicemia/ endocarditis
- Ureterosigmoidoscopy
- lnflammatory bowel disease (ulcerative colitis)
- Acromegaly
- Pelvic irradiation
- High calorie intake and obesity

289. Acrodermatitis enteropathica is inherited as?

a) X-linked recessive

b) X-linked dominant

c) Autosomal recessive

d) Autosomal dominant

Correct Answer - C

Answer- C. Autosomal recessive

Acrodermatitis enterooathica is inherited as an autosomal recessive disorder.

- Cystic fibrosis
- Phenylketonuria
- Galactosemia
- Homocystinuria
- Lysosomal storage disease.
- alpha 1-antitrypsin deficiency
- Wilson disease
- Hemochromatosis
- Glycogen storage disorders
- Acrodermatitis enteropathica

290. Multiple ileal strictures and internal fistulas are features of

a) Intestinal TB

b) Crohn's, disease

c) Ulcerative colitis

d) Diverticulosis

Correct Answer - B
Answer-B. Crohn's, disease

- Crohn's disease complicated by multiple strictures and internal fistulas.

291. True about familial adenomatous polyposis is?

a) Also known as Lynch syndrome

b) FAP gene is located on 5p21

c) 100% risk of malignancy in classical variety

d) Males are usual carriers

Correct Answer - C

Answer- C. 100% risk of malignancy in classical variety

- Familiar polyposis coli is an autosomal dominant condition affecting males and females equally
- It is also called as familial polyposis coli. It is caused by mutation in admomatous polyposis coli gene located on long arm of chromosome 5 (5q21).

292. Which of the following conditions is associated with decreased E-cadherin?

a) Invasive lobular carcinoma

b) Fibroid

c) Ductal carcinoma

d) Intestinal carcinoma

Correct Answer - A

Answer- A. Invasive lobular carcinoma

- Cadherin-E (E-cadherin) is a protein that is encoded by the CDHI gote (tumor suppressor gene).
- Loss of E-cadherin function or expression has been implicated in cancer progression and metastasis.
- E-cadherin down regulation decreases the strength of cellular adhesion within a tissue, resulting in an increase in cellular motility. This in turn may allow cancer cells to cross the basement membrane and invade surrounding tissues. E-cadherin is also involved in causation of breast cancer.
- When compared with invasive ductal carcinoma" E-cadherin expression is markedly reduced or absent in the great majority of invasive lobular carcinomas.

293. Pathology in achalasia cardia is in?

a) Excitatory neurons

b) Inhibitory neurons

c) Muscles

d) Neuromuscular junction

Correct Answer - B

Answer-B. Inhibitory neurons

- It is due to dysfunction of inhibitory neurons containing nitric oxide and vasoactive intestinal polypeptide in the distal esophagus. The cholinergic innervation ofthe LES is intact or affected only in the advanced stage.
- There is neurogenic degeneration either idiopathic or due to infection.

294. Tumor suppressor gene p53 prevents carcinoma by?

a) DNA repair

b) Cell cycle arrest

c) Apoptosis induction

d) All of the above

Correct Answer - D

Answer- D. All of the above

- p53 gene is located on chromosome 17 & acts as molecular policeman that prevents the propagation of genetically damage cell.
- p53 gene product, i.e. p53 protein is a DNA binding protein in the nucleus, when called into action, it controls the transcription of several other genes.

p53 causes:-

1. Cell cycle arrest:p-53 induces transcription of p2l,a CDK inhibitor. p2l inhibit cyclin DCDK- 4complex and there is arrest of cell cycle late in GI phase. This allow time for DNA repair.
2. DNA repair : p-53 also helps in DNA repair directly by inducing transcription of GADD 45 (growth arrest and DNA damage).

- p53 induces apoptosis by inducing the activation of apoptosis inducing gene.

295. Most common cause of renal tumor in adult is?

a) Family history

b) Smoking

c) Obesity

d) Hypertension

Correct Answer - B

Answer- B. Smoking

- Important risk factors for RCC are smoking (most significant), obesity, hypertension, asbestos exposure, estrogen therapy, CRF, tuberous sclerosis and familial conditions (Von Hippel-Lindau syndrome).

296. Gene NPHP1 encodes?

a) Fibrocystin

b) Nephrocystin

c) Polycystin

d) Podocin

Correct Answer - B

Answer- B. Nephrocystin

- Nephrocystin-l is a protein that in humans is encoded by the NPHP1 gene on chromosome 2q. The protein is known to play a role in functioning of cilia. Mutations in this gene cause familial juvenile nephronophthisis, a medullary cystic kidney disease. It is a form of ciliopathy.

297. Neutrophil count below which infection is predisposed

a) < 2000

b) < 1500

c) < 1000

d) None

Correct Answer - A

Answer- A. < 2000

- "At neutrophil counts of < 1000/L of blood, individuals are at risk from infection (with the risk of infection inversely proportional to the neutrophil count.

298. What is the position of vegetation on heart valve caused due to non bacterial thrombotic endocarditis?

a) Pocket of valves

b) Upper surface of cusps

c) Lower surface of cusps

d) Along the line of closure

Correct Answer - D
Answer- D. Along the line of closure
In NBTE, vegetations occur along the line of closure.

299. Normal PCV value is?

a) 30-35%

b) 40-45%

c) 50-55%

d) 60-65%

Correct Answer - B

Answer-B. 40-45%

- Normal values are about 45% for men and about 42% for women.
- Hematocrit or Packed cell volume (PCV)
- It is the proportion of blood volume that is occupied by red blood cells.

300. Lymphoma is caused by all of the following viruses except -

a) HIV

b) EBV

c) HSV

d) HHV8

Correct Answer - C

Answer- C. HSV

- The number of viruses associated with lymphoma has increased over the last 20 years, and includes the Epstein-Barr virus (EBV), human T-cell lymphotropic virus I (HTLVl), human immuno-deficiency virus (HIV1 and 2) and human herpesvirus 8 (HHVB).

301. Which neoplasm causes pure red cell aplasia?

a) Thymus

b) Breast

c) Hepatocellular

d) Bronchogenic

Correct Answer - A

Answer-A. Thymus

Pure red cell aplasia (PRCA) is an uncommon disorder in which maturation arrest occurs in the formation of erythrocytes.

Causes of PRCA include:

- Idiopathic
- Autoimmune disease such as SLE
- Lymphoproliferative. Association of pure red cell aplasia wlth T-cell large ganular lymphocyte lukemia is well recognized, especially in China
- Thymome
- viral infections such as HIV, herpes, parvovirus Bl9 (Fifth disease), or hepatitis
- Drugs such as mycophenolic acid or erythropoietin
- Congenital (Diamond-BlacKFan ananemia)

302. Castleman's disease is associated with?

a) Necrotizing vasculitis

b) Benign lymphoid hyperplasia

c) Necrotizing lymphadenitis

d) Coagulation defect

Correct Answer - B
Answer- B. Benign lymphoid hyperplasia
Castleman disease (CD)

- It is arare bmignlymphoproliferctive dborder.
- Although Castleman disease is not cancerous, it may also be associated with malignancies such as Kaposi sarcoma, non-Hodgkin lymphoma, Hodgkin lymphoma and POEMS syndrome

303. JAK-2 mutation is strongly associated with?

a) Burkitt's lymphoma

b) Polycythemia vera

c) Multiple myeloma

d) Mantle cell lymphoma

Correct Answer - B

Answer- B. Polycythemia vera

Janus kinase 2 (JAK- 2), a member of the janus kinase family, is a non-receptor tyrosine kinase.

- JAK2 fusions with the TEL(ETV6) (TEL-JAK2) and PCMI have found to be associated with leukemia, particularly clonal eosinophilia forms of the disease.
- JAK-2 mutations are associated with

1. Polycythemia vera,
2. Essentialthrombocythemia
3. Myelofibrosis (and other myeloproliferative disorders)

304. Franklin disease is?

a) heavy chain disease

b) 6-heavy chain disease

c) y-heavy chain disease

d) u-heavy chain disease

Correct Answer - C
Answer- C. y-heavy chain disease
Franklin's disease (gamma heavy chain disease)

- It is a very rare B-cell lymphoplasma cell proliferative disorder.
- It may be associated with autoimmune diseases and infection is a common characteristic of the disease.

305. According to WHO all are B cell lymphomas except?

a) Burkitt's lymphoma

b) Follicular lymphoma

c) Mantle cell lymphoma

d) Anaplastic large cell lymphoma

Correct Answer - D
Answer-D. Anaplastic large cell lymphoma
Peripheral T - Cell and NK - Cell Neoplasms

- T-cell prolymphocytic leukemia
- Large granular lymphocytic leukemia
- lylycosis fungoides/Sezary syndrome
- Peripheral large cell lymphoma, unspecified
- Anaplastic large cell lymphoma
- Enteropathy - associated T - cell lymphoma
- Hepatosplenic gamma delta T - cell lymphoma
- Adult T . cell leukemia / lymphoma
- NK I T - cell lymphoma, nasal type
- NK cell leukemia

306. Hairy leukoplakia is characterized by?

a) Pain

b) EBV infection

c) No association with HIV

d) Pre-cancerous

Correct Answer - B

Answer-B. EBV infection

- It is a condition caused by Epstein-Barr virus (EBV) and occurs usually in persons who are immunoxompromised, those with HIV/AIDS.

307. Example of physiological atrophy is

a) Senile atrophy

b) Disuse atrophy

c) Post pregnancy uterine atrophy

d) All of the above

Correct Answer - C
Answer- C. Post pregnancy uterine atrophy
Atrophy is reduced size of an organ or tissue resulting from a decrease in cell size and number.
Atrophy may be
1. Physiological
- atrophy of notochord and thyroglossal duct during fetal development
- Decrease in uterus size after delivery

2. Pathological

308. True about metaplasia is

a) Loss of polarity

b) Nucleus is smaller in size

c) It is a reversible change

d) Immature cells

Correct Answer - C
Answer- C. It is a reversible change
Metaplasia is an adaptive change in which one adult (mature) cell type is replaced by another adult (mature) cell.
It is reversible.

- There is no pleomorphism, and cell polarity as well as cell & nuclear size are not altered.

309. Cells responsible for basal cell carcinoma are ?

a) Melanocytes

b) Epidermal cells

c) Merkel's cells

d) Dermal cells

Correct Answer - B

Answer-B. Epidermal cells

- Basal cell carcinoma (BCC) is a nonmelanocytic skin cancer (ie, an epithelial tumor) that arises from basal cells (i.e, small, round cells found in the lower most layer of the epidermis).

310. Lipofuscin is associated with

a) Brown atrophy

b) White atrophy

c) Red atrophy

d) Black atrophy

Correct Answer - A

Answer- A. Brown atrophy

- Deposition of lipofuscin in the heart is referred as brown atrophy.

311. What is the common change in cell death associated with both apoptosis and necrosis ?

a) Cell shrinkage

b) Bleb formation

c) Chromatin condensation

d) Presence of inflammation

Correct Answer - C

Answer- C. Chromatin condensation

- Both form of cell death, finally lead to nuclear changes i.e. chromatin condensation (pyknosis).

312. Infected gangrene of skin and subcutaneous tissues is ?

a) Dry gangrene

b) Wet gangrene

c) Erysipelas

d) None of the above

Correct Answer - B

Answer- B. Wet gangrene

- Wet gangene When overlying skin of dry gangrenous tissue is devitalized, bacterial infection is superimposed.
- More commonly due to venous occlusion then arterial occlusion.

313. Fibrinoid necrosis is seen in

a) Diabetes

b) Rheumatoid arthritis

c) Pancreatitis

d) Alzheimer's disease

Correct Answer - B

Answer- B. Rheumatoid arthritis

- Diseases causing fibrinoid necrosis are malignant hypertension (most common), PAN, SLE, SABE, acute rheumatic fever (Aschoffs nodule), RA, HSP, HBV.

314. Rolled up edges are seen in which of the following ulcer -

a) Tubercular

b) Venus

c) Rodent

d) Gummatus

Correct Answer - C
Answer-C. Rodent
Rolled up- Rodent (BCC)

315. Which is pleuripotent stem cell ?

a) Embryonic stem cell

b) Tissue stem cell

c) Adult stem cell

d) Hematopoietic stem cell

Correct Answer - A
Answer- A. Embryonic stem cell
Stem cells
Embryonic stem cells : These are pleuripotent cells
Adutt stem cells

316. Which Vitamin deficiency results in poor wound healing?

a) K

b) C

c) D

d) E

Correct Answer - B

Answer- B. C

- Vitamin C is important to the synthesis of collagen and the growth of new blood vessels to replace damaged tissue. This element also has a strong antioxidizing effect that enhances the immune system and, in effect, protects against wound infection.

317. Which of the following is not a cachetic gene?

a) APEH

b) MC4R

c) Smad7

d) Smad 3

Correct Answer - C
Answer- C. Smad7
Smad 7 gene delivery prevents cachexia.

318. Edema is due to

a) Increased capillary osmotic pressure

b) Decreased hydrostatic pressure in capillaries

c) Both of the above

d) Decreased lymph flow

Correct Answer - D
Answer- D. Decreased lymph flow
Conditions causing edema-
1. Increased hydrostatic pressure of capillaries
2. Decreased plasma osmotic pressure of capillaries
3. Defective removal of interstitial fluid by lymphatics
4. Increased vascular permeability
5. Sodium (salt) and watet retention

319. All of the following are included in pathogenesis of edema except?

a) Decreased hydrostatic pressure of capillaries

b) Decreased plasma osmotic pressure of capillaries

c) lymphatic obstruction

d) Increased vascular permeability

Correct Answer - A
Answer- A. Decreased hydrostatic pressure of capillaries

320. Cardinal signs of Inflammation are all except?

a) Rubor

b) Tumor

c) Color

d) Cyanosis

Correct Answer - D

Answer- D. Cyanosis

- Cardinal signs of acute inflammation (celsus signs) : Rubor (redness), tumor (swelling), color (warmth), Dolor (pain).

321. Stellate granuloma is seen in?

a) Crohn's disease

b) Cat scratch disease

c) Hodgkin's disease

d) Berrylliosis

Correct Answer - B

Answer- B. Cat scratch disease

- Granuloma with characteristic central neutrophilic abscess surrounded by macrophages and other mononuclear cells are characteristic findings in lymph nodes in cat scratch disease.
- Granulomas are often large and irregular in shape and may exhibit a stellate configuration.

322. Lipschutz bodies are seen in ?

a) Hodgkin's disease

b) Viral hepatitis

c) Herpes

d) Yellow fever

Correct Answer - C
Answer- C. Herpes

- Lipschutz bodies are Cowdry type A intranuclear inclusion bodies seen in herpes infection.

323. Which of the following helps in movement and adhesion ?

a) MCP1

b) PGE2

c) LTB4

d) CD31

Correct Answer - D

Answer- D. CD31

- Platelet enilothelial cell ailhesion molecule (PECAM or CD-31) is present on both enilothelium and leukocytes. It is the major adhesive molecule for diapedisis

324. Most important amino acid for formation Neutrophilic extracellular trap [NET] is ?

a) Leucine

b) Methionine

c) Citrulline

d) Valine

Correct Answer - C

Answer- C. Citrulline

- Positively charged arginine is converted to neutral amino acid citrulline by the enzyme peptidyl arginine deaminase (citrullination).
- Citrullination is an essential step of NET formation.
- NETs prortiile for a high local concentration of antimicrobial componenk such as neutrophil elastase, cathepsin G and histones, that have a high affinity for DNA.

325. Slow mediators of inflammation are?

a) Leukotrienes

b) Prostaglandins

c) Interleukins

d) Vasoactive amines

Correct Answer - A

Answer- A. Leukotrienes

- Leukotrienes are slow acting, therefore LTC4, LTD4 and LTE4 are also called Slow reacting Substances of anaphylaxis (SRS-A).

326. Systemic inflammatory response syndrome, false is

a) Hypoglycemia

b) Fever

c) Leukocytosis

d) Altered mental status

Correct Answer - A

Answer- A. Hypoglycemia

It is an inflammatory state affecting the whole bodn frequently a response of the immune system to infection, but not necessarily so.

When two or more of these criteria are met with or without evidence of infection -

1. Body temperature less than 36 c greater than 38 C
2. Heart rate greater than 90 beats per minute
3. Tachypnea
4. White blood cell count less than 4000 cells/mm3
5. Hyperglycemia
6. Altered mental state

327. C3 compliment is cleared by

a) CD 59

b) CD 55

c) Factor D

d) Factor E

Correct Answer - B

Answer- B. CD 55

- Decay accelerating factor (DAF; CD55) increases the dissolution of C3 convertase.

328. HLA 2 is associated with

a) Auto immune diseases

b) Graft rejection

c) Cell mediated cytolysis of viral infected cells

d) Mixed leukocyte reaction

Correct Answer - D
Answer- D. Mixed leukocyte reaction

- MHC-II is resporrsible for graft versus host response and mked leukocyte reaction

329. Excessive accumulation of which hormone protein causes organ dysfunction -

a) Growth hormone

b) Prolactin

c) Calcitonin

d) Parathormone

Correct Answer - C

Answer- C. Calcitonin

- A. cal amyloid protein, derived from calcitonin, causes amyloidosis in medullary carcinoma of thyroid.

330. Kinky hair disease is due to defect in ?

a) Iron transport

b) Calcium transport

c) Copper transport

d) Magnesium transport

Correct Answer - C

Answer- C. Copper transport

- Kinky Hair Disease(Steely Hair Disease, Menkes disease, Copper Transport Disease)
- It is a X-linked recessive disorder that affects copper levels in the body, leading to copper deficiency.
- It is caused by mutations in the copper transport gene, ATP7A (located on chromosome Xq21.1), which is responsible for
- making a protein that is importantfor regulating the copper levels in the body.
- It is characterized by kinky hair, growth failure, and deterioration ofthe nervous system.

331. Acute graft rejection occurs within

a) 3 hours

b) 3 days

c) 3 months

d) 3 years

Correct Answer - C

Answer- C. 3 months

- Acute rejection - It occurs 5 days to 3 months after transplantation.
- Both cell-mediated (cellular) rejection and humoral (antibody mediated) rejection are involved.

332. Thyroid follicular adenoma & carcinoma are differentiated by ?

a) Nuclear pleomorphism

b) Hurthle cell change

c) Capsular invasion

d) Absence of colloid

Correct Answer - C

Answer- C. Capsular invasion

- The hallmark of all follicular adenomas is the presence of on intact, wall-formed capsule encircling the tumor.
- FNAC is the best investigation for the diagnosis of all thyroid carcinomas.
- Hurthle cells are seen both in follicular adenomas and follicular carcinoma.

333. Method of prevention of GVHD in bone marrow transplantation is

a) T-cell removal

b) Prior immune suppression

c) Post procedure immune suppression

d) All of the above

Correct Answer - D
Answer- D. All of the above
1. Prior immunosuppression
2. T cell depletion from the marrow or stem cells
3. Treatment after transplant

334. Not a testicular tumor marker -

a) a-1 antitrypsin

b) HCG

c) Alfa feto protein

d) CA-125

Correct Answer - D
Answer- D. CA-125
CA-125 is an ovarian tumor marker.

335. Non seminal germ cell tumors of testis secrete -

a) CEA

b) Acid phosphatase

c) Alfa feto protein

d) Cytokeratin

Correct Answer - C

Answer- C. Alfa feto protein

- Non-seminoma germ cell tumors (NSGCT) are spermatocytic seminoma, embryonal carcinoma, Yolk sac tumor (also called endodermal sinus tumor or infantile embryonal carcinoma), teratoma, and choriocarcinoma.

336. BRCA- 1 gene is associated with -

a) Lobular carcinoma

b) Mucinous carcinoma

c) Tubular carcinoma

d) Papillary carcinoma

Correct Answer - B

Answer- B. Mucinous carcinoma

- Familial cancers (or around 3% of all breast cancer) can be attributed to two highly penetrant autosomal dominant genes BRCA-1 on chromosome 17 (52%) and BRCA-2 on chromosoine 13.

337. No prior immune suppression is helpful in which type of graft rejection ?

a) Acute rejection

b) Hyperacute rejection

c) Chronic rejection

d) None of the above

Correct Answer - B

Answer- B. Hyperacute rejection

- Hyperacute rejection is caused by ABO incompatibility and preformed cytotoxic antibodies against donor HLA antigens.

338. Dimorphic carcinoma is -

a) Papillary carcinoma breast

b) Follicular carcinoma thyroid

c) Gastric adenocarcinoma

d) Endometrial carcinoma

Correct Answer - A

Answer- A. Papillary carcinoma breast

- Dimorphic papillary carcinoma is a term that has been use to refer to papillary carcinoma that has 2 type of neoplastic cells, with second population of cells showing pale cytoplasm.

339. Maximum ground appearance change is associated with -

a) Hep A

b) Hep B

c) Hep C

d) Hep E

Correct Answer - B

Answer- B. Hep B

- HBV-infected hepatocytes may show a cytoplasm packed with spheres and tubules of HBs Ag, producing a finely granular cytoplasm (ground-glass hepatocytes).

340. Most common malignant mesenchymal tumor of liver is -

a) HCC

b) Cholangiocarcinoma

c) Angiosarcoma

d) Hepatoblastoma

Correct Answer - C

Answer- C. Angiosarcoma

- Angiosarcoma is the most common malignant mesenchymal neoplasm of the liver.

341. Most common site for small intestinal carcinoma is -

a) Duodenum

b) Jejunum

c) lleum

d) All are affected equally

Correct Answer - A

Answer- A. Duodenum

- Adenocarcinoma is the most frequent carcinoma found in small intestine.
- Upper small intestine is the most common site for carcinoma with duodenum, jejunum and ileum.

342. Secondary allograft rejection is mediated by

a) Memory cells

b) Antibodies

c) Immune complexes

d) None of the above

Correct Answer - A

Answer- A. Memory cells

- After hlperacute rejection, transplantation of a second gfaft, which shares a significant number of antigenic determinants with the first one, results in a rapid (2 - 5 days) rejection. It is due to presence of T-lymphocyte sensitized during the first graft rejection(memory cells).

343. Increased BP, proteinuria, RBC casts are the features of which type of Glomerulonephritis ?

a) RPGN

b) Membranous GN

c) Membranoproliferative GN

d) Focal segmental glomerulosclerosis

Correct Answer - A

Answer- A. RPGN

- Haematuria, proteinuria, hypertension, edema and oliguria are the clinical features associated with Nephritic syndrome.
- Presence of RBC casts in urine is classical feature of nephritic syndrome.

344. Complement proteins constitute what percentage of serum proteins ?

a) <1

b) 1-5

c) 5-10%

d) >10%

Correct Answer - C

Answer- C. 5-10%

- The complement system consists of alarge number of proteins that together constitute about 10% of the total circulating serum protein.

345. True about Henoch Schonlein purpura is -

a) Medium vessels vasculitis

b) Renal symptoms start late in the disaese

c) IgA deposition in mesangium

d) Low Platelet count

Correct Answer - C

Answer- C. IgA deposition in mesangium

- Henoch - Schonlein purpura is vasculitis of small vessels (capillaries, venule or arterioles) and characterized by deposition of IgA in the wall of involved vessels.
- H.S. purpgra is characterized by tetrad of purpura arthritis glomerulonephritis, and abdominal pain.

Diagnosis is confirmed by presence of palpable purpura with normal platelet count along with one or more of the following:

- abdominal pain, arthralgia/arthritis and mesangial deposition of IgA.

346. To rule out rheumatoid arthrirtis, most important among the followings is -

a) HLA DR8

b) HLA DR4

c) HLA DQ1

d) HLA B27

Correct Answer - B

Answer- B. HLA DR4

- DR4 is strongly associated with RA (also with Type 1 DM Pemphigus vulgaris).

347. Cyclin Dl/lg H gene is associated with -

a) Mantle cell lymphoma

b) Hairly cell leukemia

c) Follicular lymphoma

d) Diffuse large B-cell lymphoma

Correct Answer - A

Answer- A. Mantle cell lymphoma

- Mantle cell lymphoma, a translocation has juxtaposed the llql3 band bearing cycline Dl gene with the IgH locus on chromosome 14 (11-14 translocation).

348. Amyloid protein seen in dialysis patients -

a) AA

b) AL

c) Beta - 2- microglobulin

d) ATTR

Correct Answer - C
Answer- C. Beta - 2- microglobulin

- A Beta- 2m
- Precursor- Beta-2 microglobulin
- Syndrome- Hemodialysis

349. Russel bodies are seen in -

a) Multiple Myeloma

b) Rabies

c) Parkinsonism

d) Intracranial neoplasm

Correct Answer - A

Answer- A. Multiple Myeloma

- Russell bodies are large homogenous eosinophilic inclusions formed by hugely distended endoplasmic reticulum of plasma cells.
- It is a characteristic feature of multiple myeloma.

350. Familial amyloidosis is seen in

a) Alzheimer's disease

b) Senile cardiac amyloidosis

c) Renal amyloidosis

d) Splenic amyloidosis

Correct Answer - B
Answer- B. Senile cardiac amyloidosis

- Systemic senile amyloidosis (Senile cardiac amyloidosis). Wild or non-mutant transthyretin amyloid.

351. Amyloidosis is seen in which type of diabetes mellitus?

a) Maturity onset DM

b) Type I DM

c) Type II DM

d) all of the above

Correct Answer - C

Answer- C. Type II DM

- The two best examples of localized amyloidosis are Alzheimer's disease and type 2 diabetes mellitus.
- In type 2 diabetes it is the islet amyloid polypeptide (IAPP) also known as amylin.

352. Preservative used in coagulation study is -

a) Calcium citrate

b) EDTA

c) Sodium bromide

d) Thrombin

Correct Answer - B

Answer- B. EDTA

Commonly used anti coagulants are-

- EDTA
- Heparin
- Sodium citrate
- Oxalates
- Sodium fluoride
- Sodium iodoacetate

353. Anticoagulant used for chelating calcium -

a) E DTA

b) Oxalate

c) Sodium citrate

d) All of the above

Correct Answer - D

Answer-D. All of the above

- Most of the anticoagulants used in the laboratory act by binding calcium as an insoluble salt or soluble but un-ionized salt.

Thesecalciumchelatinganticoagulantsare :-

1. EDTA
2. Double oxalate
3. Sodium citrate
4. SodiumJluoride

354. Inheritance of Crouzon syndrome is -

a) Autosomal dominant

b) Autosomal recessive

c) X-linked recessive

d) Mitochondrial

Correct Answer - A

Answer- A. Autosomal dominant

- Crouzon syndrome is an autosomal dominant disorder with complete penetrance and variable expressivity. It is characterized by premature closue of calvarial and cranial base sutures as well as those of the orbit and maxillary complex.

355. Inheritance of hereditary multiple exostoses

a) Autosomal dominant

b) Autosomal recessive

c) X-linked recessive

d) Mitochondrial

Correct Answer - A

Answer- A. Autosomal dominant

- Hereditary multiple exostoses is characterized by multiple osteochonilromas which cause limb deformities, skeletal abnormalities, short stature, nerve compression and decreased joint range of motion.
- It is inherited as autosomal dominant disorder due to mutation in EXT 1 or EXT2 gene.

356. Anti coagulant used in coagulation study is -

a) Calcium citrate

b) EDTA

c) Sodium bromide

d) Trisodium citrate

Correct Answer - D
Answer- D. Trisodium citrate

- For coagulation studies: Trisodium citrate (citric acid).

357. SnRNA mutation is associated with which syndrome ?

a) Turner syndrome

b) Prader Willi syndrome

c) Klinefelter syndrome

d) Patau syndrome

Correct Answer - B

Answer- B. Prader Willi syndrome

- The syndrome has been linked to the deletion of a region of paternal chromosome 15 that is not expressed on the maternal chromosome (Genomic imprinting). This region includes a brain-specific snRNA that targets the serotonin-2C receptor mRNA.

358. Cold agglutinins are seen in -

a) Influenza

b) PAN

c) Multiple myeloma

d) SLE

Correct Answer - A

Answer- A. Influenza

- This form of hemolytic anemia is caused by cold agglutinin IgM antibodies.
- Both intravascular and extravascular hemolysis may occur.
- Causes of cold agglutinin immunohemolytic anemia :- Mycoplasma infection, IMN, CMV, Influenm, HIV, Malignant lymphoma.

359. Lysosomal transport defect is seen in

a) Cystinosis

b) Goucher's disease

c) Metachromatic leukosytrophy

d) Tay Sach's disease

Correct Answer - A

Answer- A. Cystinosis

- Two disorders are caused by a proven defect in carrier-mediated transport of metabolites: cystinosis end the group of sialic acid storage disorders (SASD).

360. True about sickle anemia is -

a) Leucopenia

b) Decreased ESR

c) Microcardia

d) Ringed sideroblast

Correct Answer - B

Answer- B. Decreased ESR

Investigations in sickle cell anemia-

- Peripheral smear shows sickle cells, target cell and Howell - Jolly bodies.
- ESR is decreased
- Positive sickling test
- Hb electrophoresis shows two bands in heterozygous state/sickle cell trait.
- Bone changes on X-ray show:-
- A. Fish mouth vertebrae
- B. Crew hair cut (hair on end) appearance of skull.
- ('Hair on end appearance' is also seen in thalassemia, hereditaty spherocytosis and G6PD deficiency.)
- Gamma Gandy bodies

361. HER-2/neu gene causes breast carcinoma due to

a) Overexpression

b) Suppression

c) Mutation

d) Translocation

Correct Answer - A

Answer- A. Overexpression

- HER2/neu or ERBB2 gene which encodes for Receptor tyrosine-protein kinase erbB-2, also known as CD340.
- Amplification or over-expression of this oncogene has been shown to play an important role in the development and progression of certain aggressive types of breast cancer.

362. Activation of which gene leads to bladder carcinoma

a) p53

b) p7

c) n-myc

d) BRCA1

Correct Answer - A
Answer- A. p53

- Genes associated with bladder cancer are - p53 (mc), RBl, HRAS, FGFR3, TSC1.

363. In which cause of jaundice there is no bilirubin excretion in urine -

a) Obstructive jaundice

b) Primary billiary cirrhosis

c) Extrahepatic billiary atresia

d) Hemolytic jaundice

Correct Answer - D

Answer- D. Hemolytic jaundice

- All other options lead to conjugated hyperbilirubinemia. Conjugated bilirubin is water soluble and only loosel y bound to albumin and thus is easily filtered by glomeruli and excreted in urine.

364. Gene associated with superficial papillary urothelial neoplasm

a) p53

b) p16

c) p7

d) KRAS

Correct Answer - B

Answer- B. p16

- Chromosome deletions in 9p, which contains the tumor suppressor gene p16, are the only consistent finding in low grade papillary tumors and flat carcinomas in situ. Deletions in 17 p, the site of p53 gene, are often found in invasive bladder cancer.

365. ck 7 negative and ck 20 negative tumor is

a) Prostate carcinoma

b) Carcinoma colon

c) Urothelial carcinoma

d) Mesothelioma

Correct Answer - A
Answer- A. Prostate carcinoma

- CK7- 1 CK20 → carcinoma of adrenal cortex, prostate

366. There is no cyanosis in severe anemia because -

a) Certain min. amount of reduced Hb should be present

b) In anemia, 02 saturation increases

c) Hypoxia stimulates erythropoietin production

d) 02 hemoglobin curve shifts to right

Correct Answer - A

Answer-A. Certain min. amount of reduced Hb should be present

- Cyanosis is a blue coloration of the skin and mucous membranes due to the pres ence of >5 g/dl reduced hemoglobin in blood vessels near the skin surface.
- Now since in anemia the total amount of hemoglobin is decreased, the amount of reduced Hb to produce Cyanosis is not sufficient.

367. Radiation is most commonly associated with which of the following cancer ?

a) Leukemia

b) Lymphoma

c) Lung carcinoma

d) Osteoblastoma

Correct Answer - A

Answer- A. Leukemia

- Leukemia is the most common radiation induced cancer. All leukemias, except CLL, can be caused by radiations.

368. ABO incompatibility in Rh immunization has

a) Protective effect

b) Harmful effect

c) No effect

d) None

Correct Answer - A

Answer- A. Protective effect

- ABO incompatibility has protective effect against the development of Rh sensitization. This protective effect is signifcant when mother is type O and the father is A, B or AB.

369. MCHC criteria to diagnose iron deficiency anemia -

a) < 32

b) < 34

c) < 28

d) < 30

Correct Answer - B
Answer- B. < 34

Age	Hemoglobin (gm/dl)	MCHC (%)
Children 6 moths - 6 Years	11	34
Children 6 Years - 14 Years	12	34
Adult male	13	34
Adult female	34	
Pregnant woman	11	34

370. Which is not the action of TGF -

a) Anti-inflammatory

b) Proliferation of fibrous tissue

c) Inhibition of metalloproteinases

d) Anaphylaxis

Correct Answer - D

Ans. is 'd' i.e., Anaphylaxis *[Ref Robbin's 9thie p. 105]*

- TGF-I3 stimulates fibroblast migration and proliferation, increased synthesis of collagen and fibronectin, and decreased degradation of ECM due to inhibition of metalloproteinases.
- TGF-I3 is involved not only in scar formation after injury but also in the development of fibrosis in lung, liver, and kidneys that follows chronic inflammation.
- TGF-13 is also an antiinflammatory cytokine that serves to limit and terminate inflammatory responses.
- It does this by inhibiting lymphocyte proliferation and the activity of other leukocytes.

371. Chromosomal non-disjunction responsible for all except

a) Down's syndrome

b) Neurofibromatosis type 1

c) Pradderwilli syndrome

d) Angleman syndrome

Correct Answer - B

Answer- B. Neurofibromatosis type 1

Monosomy

- Turner syndrome (45XO)

Autosomal trisomy

- Downs syndrome- Trisomy 2l
- Edwards syndrome- Trisomy 18
- Patau syndrome- Trisomy 13

Sexchromosome aneuploidy

- Kleinfelter syndrome
- XYY male

Uniparentral disomy

- Pradder willi angleman syndrome

Mosiacism

- Pallister killian syndrome
- Hypomelanosis of ito

372. Which of the following is not X linked recessive?

a) Fragile X syndrome

b) Duschene muscular dystrophy

c) Diabetes incipidus

d) Spinal muscular atrophy

Correct Answer - D
Answer- D. Spinal muscular atrophy

373. What is false about GIST -

a) Associated with c-kit mutation

b) Most common site is stomach

c) Associated with CD 117

d) Least common mesenchymal neoplasm of gastrointestinal tract

Correct Answer - D

Answer- D. Least common mesenchymal neoplasm of gastrointestinal tract

- GISTs are the most common mesenchymal neoplasm of gastrointestinal tract.
- The most useful marker of GIST is c-kit (CD-117).
- The most common site being the stomach followed by small intestine.

374. Which of the following is/ are seen in Hyperparathyroidism?

a) Osteitis fibrosa cystica

b) Osteoporosis

c) Dissecting osteitis

d) All the above

Correct Answer - D

Answer- D. All the above

Healing response

- Osteitis fibrosa cystica

Other manifestations

- Absence of lamina dura (demineralization of mandible)
- Pinhead stippling of skull
- Marrow fibrosis

Resorption

- Diffuse bone resorption
- Subperiostal bone resorption of phalangeal tufts
- Brown tumor of hyperparathyroidism
- Osteoporosis
- Deformity
- Pathological fractures

375. Following is not true about the gene mutations leading to breast carcinoma -

a) Most common mutation in inherited breast carcinoma is BRCA1

b) BRCA 1 mutation is present in most of the cases of breast carcinoma

c) Inherited breast carcinomas make about 3 % of the total cases

d) p53 mutation also increases chances of colon and brain cancer

Correct Answer - B

Answer- B. BRCA 1 mutation is present in most of the cases of breast carcinoma

Genetic mutations associated with breast cancer are of two types -

i) Germline mutations (inherited mutations)

- Involved in familial cases of breast cancer.

ii) Somatic mutations (acquired mutation)

- Involved in sporadic cases of breast cancer

376. Stain used for fatty acid ?

a) Oil red 0

b) Congo red

c) Sudan III

d) Sudan black

Correct Answer - A:C:D
Answer- A, C & D
Unconjugated lipids-

- Fatty acids
- Oil red O, Sudan black, Sudan Ill & IV

377. Reversible change from on cell type to other is known as -

a) Hyperplesia

b) Hypertrophy

c) Metaplesia

d) Dysplasia

Correct Answer - C

Ans. is 'c' i.e., Metaplesia *[Ref: Robbin's 9th/e p. 376,stye p 10]*

- Metaplasia is an adaptive change in which one adult (mature) cell type is replaced by another adult (mature) cell. It is completely reversible

378. Cell membrane is damaged by

a) Hydroxyl ion

b) Hydroxyl radical

c) Nitric oxidase

d) Superoxide anion

Correct Answer - B:D

Ans. is `b > d' i.e., Hydroxyl radical > Superoxide anion

- Both hydroxyl radical and superoxide anion are free radicals and can cause membrane damage.
- But, hydroxyl radical is the most reactive and damaging free radical.
- "The hyroxyl radical is the most reactive and damaging reactive oxygen species" — Clinical biochemistry
- "The hydroxy radical is involved in free radical associated membrane damage".

379. Old age pigment is -

a) Hemosiderin

b) Melanin

c) Lipofuscin

d) Bilirubin

Correct Answer - C

Ans. is 'c' i.e., Lipofuscin [*Ref Robbin's 9th/e p. 64 & 8thie p. 36]*

- It is an insoluble pigment, also known as lipochrome and wear or tear or aging pigment. Lipofuscin is not injurious to the cell or its functions.
- Refer to APPENDIX-90 in volume-3 of this book

380. Hemosiderin contains -

a) Calcium

b) Iron

c) Magnesium

d) None

Correct Answer - B

Ans. is 'b' i.e., Iron *[Ref: Iron Metabolism p. 94]*

Hemosiderin

- It is hemoglobin derived, golden yellow to brown, granular or crystalline pigment in which form iron is stored in cells.
- When there is local or systemic excess of iron, ferritin forms hemosiderin granules. Thus hemosiderin pigment represents
- aggregrates of ferritin micelles. Under normal conditions small amounts of hemosiderin can be seen in the mononuclear
- phagocytes of the bone marrow, spleen and liver, all actively engaged in red cell breakdown.

381. True about hypertrophic scar

a) No genetic predisposition

b) More common in blood group A

c) No HLA association

d) Predominantly collagen type 4

Correct Answer - B

Ans is 'b' i.e. More common in blood group A [Ref IADVL text book of dermatology 3rdie p. 1179-80]

Etiology of hypertrophic scars

- They follow damage to deep dermis
- Autosomal dominant with incomplete inheritance.
- Associated with HLA B14, B21, Bw16, Bw35, DR5 & DQw3.
- They are more common in people with 'A' blood group.

Pathophysiology

- High level of production of collagen, elastin, fibronectin, proteoglycan & hyaluronic acid by fibroblast.
- Collagen produced is predominantly type I.
- There is increased level of TGE-131, P2, activin A, IFN-a & y, plasminogen activator inhibitor 1(PAI1) & low level of urokinase
- IL-6 plays a key role in keloid formation.

382. Cells seen in cutaneous T cell lymphoma are called

a) Councelmen bodies

b) Barr bodies

c) Sezary cells

d) Dohle bodies

Correct Answer - C

Ans is 'c' i.e. Sezary cells

[Ref Pathology and Genetics of Tumours of Haematopoietic and Lymphoid Tissues p. 219]

- Sezary cells (pleomorphic abnormal T cell with the characteristic cerebriform nuclei) are characteristic feature of Sezary syndrome (late stage of cutaneous T cell lymphoma).

383. Gaseous necrosis is seen in -

a) CMV infection

b) Staphylococcal infection

c) Treponemal infection

d) HSV infection

Correct Answer - C

Ans. is 'c' i.e., Treponemal infection ***[Ref Robbin's 9`"/e p. 43; Anderson's 10thie p. 375]***

- Caseous necrosis is a feature of syphilis which is caused by tremonemal infection.

Gaseous necrosis

- It is a variant of coagulative necrosis. It is most commonly encountered when cell death is attributable to ertain organisms
- e.g., mycobacterium tuberculosis (TB), syphilis and fungi (Histoplasma, Coccidioidomycosis).

384. Which skin tumor is k/a "Turban tumor" ?

a) Basal cell carcinoma

b) Squamous cell carcinoma

c) Cutaneous cylindroma

d) Dermatofibroma

Correct Answer - C

Ans. is 'c' i.e., Cutaneous cylindroma [Ref Tumors of skin p. 55]

- In dermatologic pathology, a dermal cylindroma, also dermal eccrine cylindroma) and (less specifically) cylindroma, is a benign adnexal tumor, which occurs on the scalp and forehead.
- Multiple cylindromas may grow together in a "hat-like" configuration, sometimes referred to as a turban tumor.

385. Cells which remain in Go phase -

a) Permanent cells

b) Labile cells

c) Intermitotic cells

d) Quiscent cells

Correct Answer - D

Ans. is 'd' i.e., Quiscent cells

Types of cells

based on their proliferative and regenerative capacity, cells are divided into :?

1) **Labile cells (continuously dividing cells) or intermitotic cells**

- These cells have capacity to proliferate and regenerate throughout the life.
- They always remain in cell cycle and have very short Go-phase (quiescent phase).

2) Stable or quiescent or reversible postimitotic cells

- They have limited capacity to proliferate and regenerate.
- They remain in Go phase of cell cycle but can enter in GI phase when stimulated i.e., they usually remain quiescent, but proliferate in response to stimuli.

3) Permanent or nondividing or irreversible postmitotic cells

- They cannot divide and regenerate. These cells are nondividing and have left the cell cycle, i.e., they do not belong to any phase of cell cycle.

386. Not associated with arrhenblastoma

a) CD56

b) Call Exner bodies

c) Sex cord stromal tumor

d) Musculanising tumor

Correct Answer - B

Ans. is 'b' i.e., Call Exner bodies *[Ref Robbin's 9th/e p. 1032* et' *8th Ie p. 1050]*

- Call-Exner bodies are seen in Granulosa-theca cell tumors (granulosa cell tumors).
- An arrhenoblastoma is a rare *musculanizing ovarian tumor,* which primarily secretes the male sex hormone, testosterone, and rarely the female sex hormone, estrogen. It is a member of the *sex cord-stromal tumor* group. Arrhenoblastomas are generally benign.
- Blood level of hormone (including testosterone, DHEA, CD56, and progesterone levels) are high.

387.

In pheochromocytoma, not a part the rule of 10 is

a) 10% are bilateral

b) 10% are malignant

c) 10% are extra adrenal

d) 10% are symptomatic

Correct Answer - D

Ans is 'd' i.e. 10% are symptomatic *[Ref Robbin's 9'"/e p. 1134 & 8th/e p. 524-525]*

- Pheochromocytomas usually subscribe to a convenient "rule of 10" or "10% tumor"; i.e. 10% of pheochromocytomas are :-

1. Bilateral
2. Extra-adrenal
3. Familial
4. Malignant
5. Multiple
6. Occur in children

388. Pancoast tumor is

a) Superior sulcus tumor

b) Inferior sulcus tumor

c) Median sulcus tumor

d) None of the above

Correct Answer - A

Ans. is 'a' i.e., Superior sulcus tumor *[Ref Clinical Scenarios in Surgical Oncology p. 39]*

- It is a *tumor of the pulmonary apex* typically found in conjunction *with a smoking history.* It is situated at the top end of either the right or left lung.
- Most Pancoast tumors are non-small cell cancers i.e. squamous cell carcinomas (SCCs) or adenocarcinomas.

389. Owl' *eye* nucleus is seen in which type of lymphoma?

a) Non- Hodgkin's lymphoma

b) Hodgkin's lymphoma

c) Burkitt's lymphoma

d) Cutaneous T-cell lymphoma

Correct Answer - B

Ans is 'b' i.e., Hodgkin's lymphoma [Ref Robbin's 9'^{1}'M p. 607 & 8th/e p. 617]

- "Owl's eye" appearance of entire nucleus is seen in Reed-Sternberg cells.
- Reed-Sternberg cells are giant cells with multinucleated or have a bibbed nucleus with prominent eosinophilic inclusion-like nucleoli (thus resembling an "owl's eye" appearance). These are positive for CD 15 and CD 30, and also PAX-5 (B-cell transcription factor).
- Hodgkin's disease is characterized by presence of Reed-sternberg cells (Classical Reed-sternberg cells) and its variants.
- They can also be found in reactive lymphadenopathy (such as infectious mononucleosis immunoblasts which are RS like in appearance], carbamazepine associated lymphadenopathy) and very rarely in other types of non-Hodgkin lymphomas. Anaplastic large cell lymphoma may also show RS like cells.

390. Stem cells are -

a) Labile

b) Stable

c) Permanent

d) None

Correct Answer - A

Ans. is 'a' i.e., Laible ***[Ref Rubin's p. 64]***

- Bone marrow stem cells are labile cells, i.e. Continuous dividing cells.
- Under appropriate conditions, tissues composed of labile cells regenerate after injury, provided that enough stem cells remain.

391. ALL -L3 resembles

a) Mantle cell lymphoma

b) MDS

c) Burkitt's lymphoma

d) AML

Correct Answer - C

Ans. is 'c' i.e., Burkitt's lymphoma [Ref O.P. Ghai 6th le p. 562; Robbin's 7th/e p. 677]

- Acute lymphoblastic leukemia (ALL) encompasses a group of neoplasms composed of immature, precursor B (Pre-B) or T (Pre-T) lymphocytes referred to as lymphoblast.
- Cellular classification :- French-American-British (FAB) system divides ALL into three morphological subtypes :?

.. Ll lymphoblasts : It is most common type and has better prognosis. Cells have scanty cytoplasm and inconspicuous nuclei.

2. L2 lymphoblasts : Cells are large and more pleomorphic in size with abundant cytoplasm and prom inant nucleus.

3. L3 lymphoblasts : It is least common type. It is identical to Burkitt's lymphoma, i.e. Mature B-cells.

392. Characteristic of exudative fluid is -

a) Low protein content

b) Specific gravity < 1.012

c) Normal vascular permeability

d) Cellular debris

Correct Answer - D
Ans. is 'd' i.e., Cellular debris
Types of edema fluid
In edema, the fluid accumulated in interstitial fluid may be either a transudate or an exudate.

- **Exudate** is an inflammatory fluid that contains high protein content, cellular debris, and specific gravity >1.020. It occurs due to increased vascular permeability.
- **Transudate** contains low protein (mostly albumin) with specific gravity < 1.012.
- It is an ultrafiltrate of plasma that results from hydrostatic or osmotic imbalance between intravascular and extravascular compartments despite normal vascular permeability

393. Increase in MCHC is associated with

a) Iron deficiency anemia

b) Megaloblastic anemia

c) Anemia of chronic disease

d) Hereditary spherocystosis

Correct Answer - D

Ans is 'd' i.e. Hereditary spherocystosis [Ref Robbin's 9th Ie p. 633 & 8th/e p. 643]

- Mean cell hemoglobin concentration (MCHC) is the average concentration of hemoglobin in a given volume of packed red blood cells, expressed in grams per deciliter. Normal value is 33-37 gm/dl
- MCHC is increased in hereditary spherocytosis, not because of increased hemoglobin, but due to decerase volume of spherocytes.
- MCHC is decreased in microcytic hypochromic anemia(iron deficiency anemia & anemia of chronic disease).
- MCHC remains normal in megaloblastic anemia.

394. A 15 year old girl presented with weakness for 2 months. On examination she had pallor and icterus. Spleen was palpable. Lab examination findings are increased MCV, reduced MCHC, reticulocystosis. Osmotic fragility test is positive and Coomb's test is negative. Diagnosis is

a) Iron deficiency anemia

b) AIHA

c) G-6-PD deficiency anemia

d) Hereditary spherocytosis

Correct Answer - D

Ans is 'd' i.e. Hereditary spherocytosis

- Icterus, pallor, palpable spleen, reticulocystosis all are indicating towards hemolytic anemia.
- In AIHA Coomb's test is positive .
- In G-6-PD deficiency osmotic fragilty is not affected.
- All the findings in the case positive in Hereditary spherocytosis.
- Iron deficiency anemia shows reduced MCV and MCHC. Osmotic fragilty is reduced in case of iron deficiency

395. Most important change to occur in irreversible cell injury -

a) Decreased basophillia

b) Pyknosis

c) Accumulation of myelin figures

d) Membrane damage

Correct Answer - D

Ans is 'd' i.e. Membrane damage ***[Ref Robbins's illustrated 9th le p. 45-47 & 8th/e p. 19]***

- Membrane damage is the central pathogenic process in irreversible injury.

396. Blood group antigens chemically are

a) Carbohydrate

b) Glycoprotein

c) Phospholipids

d) Polysaccharide

Correct Answer - B

Ans is 'b' i.e.,Glycoprotein ***[Ref Harrison 18th/e p. 951]***

- The ABO antigens are determined to be glycoproteins and glycolipids.

397. True about adult autologous stem cell transplant are all except -

a) Used in the treatment of leukemia

b) Stem cells are collected directly from the bone marrow

c) G-CSF is given to expand the number of stem cells

d) It allows high dose of chemotherapy

Correct Answer - B

Ans. is 'b' i.e., Stem cells are collected directly from the bone marrow

Autologous stem cell transplant

- An autologous transplant uses the person's own stem cells. These cells are collected in advance and returned at a later stage.
- They are used to replace stem cells that have been damaged by high doses of chemotherapy, used to treat the person's underlying disease.
- It is an OPD procedure..
- In most cases, stem cells are collected directly from the bloodstream.
- Granulocyte Colony Stimulating Factor (G-CSF) is used to expand the number of stem cells in the marrow and cause them to spill out into the circulating blood.
- Autologous transplants are used to treat a number of different blood cancers - leukaemias lymphomas and myeloma, and certain solid tumours - breast cancer, testicular cancer, osteosarcoma and others.
- Autologous transplants allow the use of high dose chemotherapy and sometimes radiotherapy (k/a condition therapy).
- After the transplant blood counts drop dramatically in the week

following your conditioning therapy.

- Exposing the patient to the risk of infections and bleeding. Antibiotics and other drugs are commonly prescribed to help prevent or treat infections during this time, and platelet transfusions is also given to reduce your risk of bleeding.

398. Leiden mutation is

a) Non sense mutation

b) Mis-sense mutation

c) Frame shift mutation

d) Tri nucleotide repeat mutation

Correct Answer - B

Ans. is 'b' i.e., Mis-sense mutation [Ref Disorders of Thrombosis and Hemostasis p.289]

- Factor V Leiden (FVL) mutation is a mis-sense type of point mutation in the gene for clotting factor V. As a missense substitution of base G to base A, it changes the protein's amino acid from arginine to glutamine.
- It has autosomal dominant inheritance and is the most common cause of inherited thrombophilia.
- Factor V is one of the essential clotting factors in the coagulation cascade.
- FVL mutation causes activated protein C resistance, hence leading to the hypercoagulable state.
- It is associated with increased risk of DVT 6, recurrent miscarriages

399. Centre of tubercular granuloma is formed by -

a) T-lymphocytes

b) B-lymphocytes

c) Langhan's giant cells

d) Necrotic zone

Correct Answer - D

Ans. is 'd' i.e.,Necrotic zone *[Ref Bobbin's pathology p. 29]*

Tubercular granuloma

- Tubercular granuloma contains mostly blood-derived macrophages, epithelioid cells (differentiated macrophages) and multinucleated giant cells (also known as Langhans giant cells), surrounded by T-lymphocytes.
- Caseous granulomas are typical of tuberculosis. These structures are formed by epithelioid macrophages surrounding a central cellular necrotic region with a rim of lymphocytes of the T- and B-cell types.

400. Factor IX deficiency results in increased

a) PT [Prothrombin Time]

b) PTT [Partial thromboplastin time]

c) BT [Bleeding Time]

d) TT [Thrombin time]

Correct Answer - B

Ans. is 'B' i.e., PTT (Partial thromboplastin time) [Ref: Robbin's 9th/e p. 118; Harrison's 17'/e p. 363,364; Ganong 23"1/e p. 533; Harsh Mohan 6thie p 330]

- Partial thromboplastin time (PTT) :It tests the intrinsic and common coagulation pathways. So, a prolonged PTT can
- results from deficiency of factor V, VIII (factor VIIIc, Von willebrand factor), IX, X, XI, XII, prothrombin or fibrinogen.
- Prothrombin time (PT) :It tests the extrinsic and common coagulation pathways. So, a prolonged PT can results from deficiency of factor V, VII, X, prothrombin or fibrinogen.
- Thus in common coagulation pathway defect both PT and PTT are elevated.
- Activated clotting time (clotting time) :It also tests the intrinsic and common coagulation system. So it is prolonged in deficiency of same factors as for prolonged PTT

401. Antishkow's cells are seen in

a) Rheumatic heart disease

b) Rheumatic arthritis

c) Bacterial endocarditis

d) Marantic endocarditis

Correct Answer - A

Ans. is 'a' i.e.,Rheumatic heart disease [Ref Robbin's 9th le p. 558 & 8th/e p. 565]

- Anitschkow (or Anichkov or catterpiller) cells are often cells associated with rheumatic heart disease.
- Anitschkow cells are enlarged macrophages found within granulomas (called Aschoff bodies) associated with the disease.
- Aschoff bodies (Aschoff nodules) are characteristic inflammatory lesions of acute rheumatic fever found in any of the three layers of heart, but mostly seen in myocardium (myocarditis).
- They consist of foci of collagen surrounded by following cells : Lymphocytes (especially T-cells), plasma cells, aschoff giant
- cells, antischkow cells, histiocytes and fibroblasts. Neutrophils (polymorphonuclear cells) are characteristically absent.

402. Macrophage chemotactic factor is -

a) High molecular weight

b) Chymotrypsin sensitive

c) Heat labile

d) Are antigenically similar to C3

Correct Answer - B

Ans is 'b' i.e.,Chymotrypsin sensitive *(Ref Immunology p. 278)*

- Macrophage chemotactic factor properties has Low molecular weight (12000), has a isoelectric points of 10.1 & 5.6, and is sensitive to treatment by chymotrypsin while resistant to RNase and neuraminidase.
- It is heat stable and angenically different from C3 & C5.

403. Function of IL-4 is -

a) Inhibiting IL-1

b) Chemotaxis

c) Vasodilatation

d) Inhibiting macrophages

Correct Answer - A

Ans is 'a' i.e. Inhibiting IL-1 ***[Ref Principles of Cancer Biotherapy p.1731***

- "In monocytes, IL-4 inhibits IL-1, TNF-alpha and IL-6." - Principles of Cancer Biotherapy p.173.

404. Blood loss in class III hemorrhagic shock -

a) < 750 ml

b) 750 - 1500 ml

c) 1500-2000 ml

d) > 2000 ml

Correct Answer - C
Ans. is 'c' i.e.,1500-2000 ml ***[Ref: Textbook of clinical pathology p. 522]***

405. Anti RO [SSA] antibodies are seen in -

a) Subacute cutaneous lupus

b) Myasthenia gravis

c) Systemic sclerosis

d) Mixed connective tissue disorder

Correct Answer - A

Ans. is 'a' i.e., Subacute cutaneous lupus ***[Ref Robbin 's 9th/e p. 218-218 & 8th Ie p. 215]***

- Anti-RNP SS-A (Ro), SS-B (La) are seen in neonatal lupus with congenital heart block and in subacute cutaneous lupus.
- These antibodies are associated with decreased risk of lupus nephritis.

406. BRACI is not associated with

a) Ovarian carcinoma

b) Breast carcinoma

c) Endometrial carcinoma

d) Fallopian tube cancer

Correct Answer - C

Ans is 'c' i.e. Endometrial carcinoma [Ref Robbin's 9'/e p. 298 & 8th/e p. 287]

- BRCA-1 er BRCA-2 are commonly associated with - Carcinomas of ovary and breast.
- Less commonly BRAC-2 is also associated with 4 Carcinomas of colon, prostate and pancreas.

407. Antigen involved in post transplant rejection -

a) HLA - Antigen

b) Nuclear antigen

c) Polysaccharide

d) DHA

Correct Answer - A

Ans. is 'a' i.e., HLA - antigen ***[Ref Robbin's 5^{0}/e p. 231-232 & 8th/e p. 226, 227]***

- For rejection of graft, there must be some antigen that is recognized as foreign and the most important antigen is HLA antigen of grafted tissue.

408. Surface Immunoglobulin is found in which cell ?

a) T-cell

b) B-cell

c) NK cell

d) Plasma cells

Correct Answer - B

Ans is b' i.e. B-cell *[Ref Robbin's 9"le p. 191 & 8`"/e p. 187]*

- B cells recognize antigen via the B-cell antigen receptor complex.
- Ig M and Ig D, present on the surface of all naïve B cells, constitute the antigen binding component of B-cell receptor complex.
- After antigenic stimulation, B cells form plasma cells that secret immunoglobulin.

409. Molecular study is important in the management of which malignancy?

a) Multiple myeloma

b) Renal cell carcinoma

c) Seminoma

d) Basal cell carcinoma

Correct Answer - A

Ans. is 'a' i.e., Multiple myeloma [Ref: Hemostatic Disorders p. 26]

Molecular study is useful in the following cancers

- Multiple myeloma
- Prostate cancer
- Myelodysplastic/myeloproliferative disorders
- Soft tissue sarcoma
- Neuroblastoma
- Systemic mastocytosis
- Ovarian epithelial/fallopian tube/primary peritoneal cancers
- Thyroid cancer

410. HLA 2 is linked with -

a) Graft rejection

b) Graft versus host disease

c) Killing of viral infected cells

d) Susceptibility to autoimmune diseases

Correct Answer - B

Ans. is 'b' i.e., Graft versus host disease ***[Ref Harrison 18th/e p. 2668-2670*** **et' *17h/e p. 2023; Robbin's 9th/e p. 194 & 8`h/e p. 192]***

- MHC class I is responsible for graft rejection and cell mediated cytolysis of viral infected or tumor cells.
- MHC-II is responsible for graft versus host response and mixed leukocyte reaction
- MHC-III is involved in susceptibility to autoimmune diseases like SLE.

411. Marker for pancreatic non-functional neuro-endocrine tumor [PNET] is

a) Chromogranin-A

b) CD100

c) CEA

d) PSA

Correct Answer - A

Ans is 'a' i.e. Chromogranin-A [Ref Neuroendocrine Tumors p. 33]

- Chromogranin-A (CgA) is a glycoprotein used commonly as a tumor marker in histopathology but also has elevated circulating levels in patients with both functional and non-functional PNETs.
- Other markers for PNETs - pancreatic polypeptide (PPP), pancreastatin, and neuron-specific enolase (NSE).

412. Substance playing a role in tumor metastasis cascade is

a) Collagenase IV

b) TNF-alpha

c) CD99

d) NM23

Correct Answer - A

Ans is 'a' i.e. Collagenase IV

Various steps of metastasis and molecules involved

1. Detachment of tumor cells - Down regulation of expression of either E-cadherins or catenins
2. Attachement to ECM (including basement membrane) - Tumor cells express integrins that helps in the attachement.
3. Degradation of ECM - proteolytic enzymes (most important proteases are metalloproteinases (MMPs) including collegenase IV).
4. Vascular dissemination and homing of tumor cells - Among adhesion molecule CD44 is of particular interest.

413. Microcytotoxicity is used for -

a) Tissue typing

b) Drug allergy

c) Infection susceptibility

d) Substance toxicity

Correct Answer - A

Ans. is 'a' i.e.,Tissue typing *[Ref Internet]*

- A micro-cytotoxicity assay, utilizes serum with known anti-HLA antibodies that recognize particular HLA loci (HLA-A, HLA-B, HLA-C, HLA-DP, HLA-DQ, HLA-DR) in order to match genetically similar individuals in hopes of performing *a* tissue transplantation.
- In this technique a donor's blood cells are MHC typed by mixing them with serum containing the anti-HLA antibodies.
- If the antibodies recognize their epitope on the MHC then complement activation occurs and the cell will be osmotically lysed.
- Another technique of tissue typing, "mixed leukocyte reaction", is performed by culturing lymphocytes from the donor together with those from the recipient.
- It tests cell mediated response against the tumor cells.

414. Defective chromosome associated with De-George syndrome is -

a) 7

b) 15

c) 17

d) 22

Correct Answer - D

Ans. is 'd' i.e., *22 [Ref Robbin's 9^{1}Ve p. 163 & 8th/e p. 162]*

- This syndrome encompasses a spectrum of disorders that result from a small deletion of *band q 11.2 on long arm of chromosome 22.*

Clinical features are considered to represent two different disorders :-

1) Di George syndrome

- These patients have thymic hypoplasia with resultant T-cell immunodeficiency.
- Other features include parathyroid hypoplasia (causing hypocalcemia), cardiac malformations & facial anomalies.
- TBX-1 gene (a T-box transcription factor) is most closely associated with this syndrome.
- The target of TBX-1 include PAX 9, a gene that controls the development of the palate, parathyroid and thymus.

2) Veto cardio facial sndrome

- This syndrome is characterized by facial dysmorphism (prominant nose, retrognathia), cleft palate, cardiovascular anomalies, and learning disabilities.

415. Mutation in p53 gene is associated with which malignancy ?

a) Endometrial carcinoma

b) Retinoblastoma

c) Colorectal carcinoma

d) Prostate cancer

Correct Answer - C

Ans. is 'c' i.e., Colorectal carcinoma *[Ref Robbin's 9th/e p. 814 & 8thie p. 825]*

- P53 mutations associated with breast, colorectal, liver, lung, and ovarian cancer.

416. Rb gene is located on which chromosome?

a) 6

b) 9

c) 13

d) 21

Correct Answer - C

Ans. is 'c' i.e.,13 ***[Ref Robbin's 9tVe p. 290]***

- Retinoblastoma gene (RB gene) is located on 14 band on the long arm of chromosome 13 (13q14). RB gene is a tumor supressor gene.
- Retinoblastoma develops when both the normal alleles of the RB genes are inactive or altered. It is typical example of Knudson's two hit hypothesis.

417. Non sense mutation is seen in -

a) AIHA

b) Thalassemia

c) Sickle cell anemia

d) Hemophilia

Correct Answer - B

Ans. is 'b' i.e., Thalassemia ***[Ref Robbin's ^{9tv}–e p 141 & 8^{th}/e p. 141-142]***

- Nonsense mutation is seen in beta-thalassemia, cystic fibrosis, Duchenne muscular dystrophy and Hurler syndrome.

418. Gene not associated with Diabetes malitus -

a) PPARy

b) KCNJ11

c) CTLA4

d) PDGF-R

Correct Answer - D

Ans is 'd' i.e. PDGF-R *[Ref Various books & internet]*

- PDGF-R gene is associated with glioma.

Gene	**locus**
HLA-DQB1/IDDM1	6p21.3
INS (insulin)	11p15. 5
CTLA4 (cytotoxic T lymphocyte-associated 4)	2q31-35

419. PTEN gene mutation is seen in -

a) Ovarian carcinoma

b) Li - Fraumani syndrome

c) Endometrial carcinoma

d) MEN2A

Correct Answer - C

Ans is 'c' i.e. Endometrial carcinoma *[Ref: Robbin's 9th/e p. 298 & 8th Ie p. 287]*

- PTEN is a tumor suppressor gene which is implicated in the causation of endometrial and prostate carcinoma

About other options

- Ovarian carcinoma - BRCA2
- Li - Fraumani syndrome - p53
- MEN2A - RET.

420. Carcinoma with no or minimal metastasis -

a) Squamous cell carcinoma

b) Basal cell carcinoma

c) Melanoma

d) Leydig's cell carcinoma

Correct Answer - B

Ans. is 'b' i.e.,Basal cell carcinoma *[Ref Atlas of Diagnostic Oncology p.452]*

- "Basal cell carcinoma can be locally destructive, but only exceptional reports of cases with metastatic behavior exist in literature."

421. Epithelioid hemangioendothelioma of nose is

a) Carcinoma

b) Sarcoma

c) Carcinosarcoma

d) Hamartoma

Correct Answer - B

Ans. is 'B' i.e., Sarcoma

- Soft tissue sarcoma arise from mesenchyme, like muscles (myoma), endothalial cells (endothelioma) and cartilage (chondroma)
- Epithelioid hemangioendothelioma (EHE) is a soft tissue sarcoma.
- It arises from distinct type of endothelial cells which exhibit epitheloid morphology.

422. Most common carcinoma is associated with IVC metastasis

a) Small cell carcinoma lung

b) Gastric adenocarcinoma

c) Renal cell carcinoma

d) Papillary carcinoma thyroid

Correct Answer - C

Ans is 'c' i.e. Renal cell carcinoma [Ref Current Therapy in Vascular and Endovascular Surgery p. 948]

- The one of the striking characteristics of RCC is to invade renal vein and metastasize into IVC.

Through blood

- Renal cell carcinoma
- Pheochromocytoma
- Adrenocortical carcinoma
- Uterine sarcomas (Lemmyomatosis, endometrial stromal cell sarcoma)
- Germ cell tumors (embryonal, teratocarcinoma)

Direct invasion

- Retroperitonel soft tissue tumors (hposarcoma, leipmyosarcoma, malignant fibrous histiosarcoma)
- Hepatic tumors (cholangiocarcinoma, HCC)
- Pancreaticodudenal tumor.

423. Not a specific tumor marker is -

a) CD 99

b) HMB 45

c) β- globulin

d) CEA

Correct Answer - D

Ans is 'd' i.e., CEA *[Ref Chandrasoma Taylor* 3rdiep. *298-296; Robbin's 8th/e p. 327]*

- Carcinoembryonic antigen (CEA) is used as tumor marker for colorectal cancer (major use), lung cancer, breast cancer and ovarian cancer.
- It is alsoincreased in non-neoplastic conditions like alcoholic cirrhosis, hepatitis, IBD (CD, UC), smoking and pancreatitis.
- CEA lacks sensitivity as well as specificity, hence cannot be used to confirm the diagnosis.

About other options

- CD 99 - specific marker for Ewing's sarcoma
- HMB 45 - specific marker for malignant melanoma
- β - globulin - specific marker for multiple myeloma

424. Follicular dendritic cells, main function is -

a) Catches antigen and presents it to T cells

b) Catches antigen and presents it to B cells

c) Phagocytic activity

d) Produce immunoglobulins

Correct Answer - B

Answer- B. Catches antigen and presents it to B cells

- A second type of cell with dendritic morphology is present in the germinal centers of lymphoid follicles in the spleen and lymph nodes and is called the follicular dendritic cells.
- Such cells play a role in humoral immune responses by presenting antigens to B cells and selecting the B cells that have the highest affinity for the antigen, thus improving the quality of the antibody produced.

425. Collagen affected in Osteogenesis imperfecta -

a) Type I

b) Type II

c) Type III

d) Type IV

Correct Answer - A
Answer- A. Type I

- Osteogenesis imperfecta also known as brittle bone disease, or 'Lobstein syndrome" is a congenital bone disorder.
- People with OI are born with defective connective tissue, or without the ability to make it, usually because of a deficiency of Type-I collagen.

426. Not seen in children

a) Neuroblastoma

b) Retinoblastoma

c) Hepatoblastoma

d) Seminoma

Correct Answer - D
Answer- D. Seminoma
Childhood malignancies are

- Leukemia (AML' ALL)
- Brain tumors
- Soft tissue sarcoma → Rhabdomyosarcoma
- Lymphoma
- Neuroblastoma
- Wilm's tumor
- Bone tumor
- Retinoblastoma
- Hepatoblastoma

427. Systemic military TB occurs when spread occurs via -

a) Arterial

b) Venous

c) Lymphatic

d) Direct dissemination

Correct Answer - B

Answer- B. Venous

- Systemic miliary tuberculosis occurs when tubercle bacteria disseminate through the systemic arterial system.
- Miliarpuberculosis is most prominent in the liver, bone marrow, spleen, adrenals, meninges, kidneys, fallopian tubes, and epi-didymis, but could involve any organ.

428. Most common cause of primary hyperpara-thyroidism -

a) Hyperplasia

b) Solitary Adenoma

c) Carcinoma

d) Multiple adenomas

Correct Answer - B
Answer- B. Solitary Adenoma

- Parathyroid adenoma (85% to 95%)

429. Early age of sex is risk factor for

a) Carcinoma cervix

b) Carcinoma vulva

c) Carcinoma vagina

d) Carcinoma ovary

Correct Answer - A

Ans. A. Carcinoma cervix

- Early Coitarche (early age of first intercourse) is a risk factor for carcinoma cervix.

430. Electron microscopy change in reversible cell injury is ?

a) Cell shrinkage

b) Plasma membrane blebbing

c) fatty change

d) Fragmentation

Correct Answer - B

Answer- B. Plasma membrane blebbing

The ultrastructural charges (seen on electron microscopy) are :-

1. Plasma membrane altetations → Blebbing blunting loss of microvill.
2. Mitochonhial changes → Swelling, small amorphous densities.
3. Dilatation of ER and detachment of ribosome
4. Nuclear alterations

431. Smoking is not a risk factor for

a) Lung carcinoma

b) Osteoporosis

c) Nonunion of bones

d) Alzhiemers disease

Correct Answer - D
Answer- D. Alzhiemers disease

- "Recent research has shown that smoking is a signifcant risk factor for vascular dementia and Alzheimer's disease, with smokers twice as likely to develop the disease as non-smokers".

432. Tense and painful thyroiditis is

a) Dequervian's thyroiditis

b) Riedel thyroiditis

c) Hashimoto thyroiditis

d) Subacute lymphocytic thyroiditis

Correct Answer - A
Answer- A. Dequervian's thyroiditis

- Dequervain thyroidits (granulomatous thyoiditis) → Most common cause of thyroid pain.

433. Apoptoic bodies are ?

a) Pyknotic nucleus with organelles

b) Opened up chromatin bodies

c) Membrane bound cytoplasm without organelles

d) Clumped chromatin bodies

Correct Answer - A

Answer- A. Pyknotic nucleus with organelles

Important apoptotic bodies are :-

1. civatte bodies or colloid bodies in lichen planus.
2. sunburn cells
3. Kamino bodies in melanocytic lesions
4. Satellite dyskeratotic cells
5. councilman bodies in acute viral hepatitis
6. Eosinophilic globules
7. Tingible bodies (founds in macrophages) in lymphoma

434. Which of the following is true about Reidel's thyroiditis

a) Fibrosis involves the thyroid and surrounding neck structures

b) Patient presents with hard fixed thyroid mass

c) It may be associated with retroperitoneal fibrosis

d) All the above

Correct Answer - D

Answer- D. All the above

- A rare disorder characterized by extensive fibrosis involving the thyroid and contiguous neck structures.
- The presence of a hard and fixed thyroid mass clinically simulates a thyroid carcinoma.
- It may be associated with fibrosis in other sites in the bodn such as the retroperitoneum, and appears to be another manifestation of a systemic autoimmune IgG4-related disease, which is associated with fibrosis and tissue infiltration by plasma cells producing IgG4.

435. All are factors of poor wound healing except -

a) Young age

b) Infection

c) Zinc deficiency

d) Vitamin D deficiency

Correct Answer - A

Answer- A. Young age

Systemic factors

1. Poor nutrition (protein deficiency, vitamin C deficiency)
2. Metabolic abnormalities (Diabetes mellitus).
3. Poor circulatory status (Inadequate blood supply)
4. Hormones, e.g. glucocorticoids

B. Local factors

1. Infection is the single most important factor.
2. Mechanical factors, e.g. early mobilization.
3. Foreign bodies (unnecessary sutures, fragments of steel or glass).
4. Wound in poorly vaculatized area, e.g. foot.

436. Wilm's tumor associated with all except

a) WAGR

b) Beckwith Weidman

c) Dennis dash

d) Digeorge syndrome

Correct Answer - D
Answer- D. Digeorge syndrome
These are -

- WAGR syndrome
- Denys - Drash syndrome
- Beckwith - Wiedeman syndrome

437. In muscle hypertrophy alpha myosin changes to ?

a) Beta

b) Gamma

c) Theta

d) Delta

Correct Answer - A

Answer- A. Beta

- During muscle hypertrophy the alpha isoform of myosin heavy chain is replaced by the beta isofom, which has a slower, more energetically economical contraction.

438. Most common site of gastrointestinal carcinoid is -

a) Duodenum

b) Appendix

c) Ileo-Jejunum

d) Stomach

Correct Answer - C

Answer- C. Ileo-Jejunum

- Carcinoid tumors arise from the neuroendocrine cells (Argentaffin cells or Kulchitsky cells).
- The majority are found in GI tract, and more than,l0% in small intestine (jejunum & ileum).
- The tracheobronchial tree and lungs are the next common sites involved.

439. Absence of Ultra hepatic bile duct leads to which syndrome?

a) Von Meyenburg Complexes

b) Polycystic Liver Disease

c) Caroli Disease

d) Alagille Syndrome

Correct Answer - D

Answer- D. Alagille Syndrome

- It is an autosomal recessive condition characterized by absence of bile ducts in portol tract,

440. Heroin abuse causes ?

a) Focal segmental glomerulonephritis

b) Cresent glomerulonephritis

c) Membraneus glomerulonephritis

d) Diffuse glomerulonephritis

Correct Answer - A

Answer- A. Focal segmental glomerulonephritis

Clinically it presents as nephrotic syndrome.

Causes

1. HIV infection
2. Heroin addiction
3. Sickle cell disease
4. Massive obesity
5. IgA nephropathy
6. Reflux nephropathy
7. Idiopathic

441. The most common antecedent of erythroplakia and leukoplakia is

a) Diphtheria

b) Tobacco use

c) Alcohol

d) Poor oral hygiene

Correct Answer - B
Answer- B. Tobacco use

442. Clear cell renal carinoma is due to ?

a) 3p deletion

b) 3q deletion

c) 6p deletion

d) 9p deletion

Correct Answer - A

Answer- A. 3p deletion

- Clear cell- cell origin (proximal tubule)- 3p deletions (3p-), VHL gene mutations, 5q gains

443. Which blood group is universal donor ?

a) A

b) B

c) 0

d) AB

Correct Answer - C
Answer- C. 0

- Blood group'O'→ Universal donor

444. Most common type of class II mutation in cystic fibrosis is

a) Missense mutation

b) Frameshift

c) Non sense

d) Deletion

Correct Answer - D
Ans. D. Deletion

- Class II mutation : 'Deletion' of phenylalanine amino acid so CFTR protein fails to reach cell membrane

445. Most common blood group in India is ?

a) A

b) B

c) AB

d) 0

Correct Answer - D
Answer- D. 0

- Genotype- OO
- Phenotype- O
- Indian population- 40%

446. Cross matching is done with ?

a) Donor's serum and patient's RBC

b) Donor's RBC and patient's serum

c) Donor and patient's serum

d) Donor and patient's RBC

Correct Answer - B

Answer- B. Donor's RBC and patient's serum

- Cross-matching consists of mixing the patient's serum with donor saline-suspended red cells.

447. H pylori causes all except

a) Antral gastritis

b) Gastric carcinoma

c) Atrophic gastritis

d) GIST

Correct Answer - D
Answer- D. GIST

- H pylori is associated with > 80% of duodenal ulcers and > 60% of gastric ulcers.
- It also produces atrophic gastritis, gastric adenocarcinoma and MALTomas (GI B-ceU tymphoma).

448. Liver finding of child with reye's syndrome is ?

a) Macrovesicular steatosis

b) Microvesicular steatosis

c) Hepatocellular necrosis

d) Noncaseating epithelioid granulomas

Correct Answer - B
Answer- B. Microvesicular steatosis
Reye's syndrome is a metabolic mitochondrial disorder characterized by-
1. Microvesicular fatty infiltration ofliver
2. Encephalopathy
3. Sometimes fatty infiltration of kidney

449. When do neutrophils appears in myocardial infarction?

a) Less than 4 hours

b) 4-12 hours

c) 12-24 hours

d) 1-3 days

Correct Answer - C
Answer- C. 12-24 hours

- 12-24 hr- Dark motting- In light microscopy, ongoing coagulative necrosis, marginal contraction band necrosis, beginning if neutrophilic infiltration.

450. Which of the following is not seen in early phase of myocardial infarction on microscopy ?

a) Coagulation necrosis

b) Edema

c) Hemorrhage

d) Fibrosis

Correct Answer - D

Answer- D. Fibrosis

- Fibrosis (scarring) occurs late.
- Coagulation necrosis, hemorrhage and edema are seen within 4-12 hours.

451. Which of the following is a immune privileged sites ?

a) Kidney

b) Testis

c) Lung

d) Liver

Correct Answer - B

Answer- B. Testis

- The term immune privilege refers to the phenomenon where tissue allografts transplanted to certain anatomical sites appear exempt from the rules that normally govern graft rejection

452. Adamantinoma usually arise from ?

a) Dental lamina

b) Endodermal tissue

c) Periapical tissue

d) Odotogenic tissue

Correct Answer - D
Answer- D. Odotogenic tissue

- Ameloblastoma (adamantinoma) : It is a locally aggressive tumour that arises from the odontogenic tissue and invades the maxillary sinus. Treatment is surgical excision

453. Lymphoid tissue is seen in which parotid tumor -

a) Pleomorphic adenoma

b) Warthins tumor

c) Adenoid cystic

d) Mucoepidermoid

Correct Answer - B

Answer- B. Warthins tumor

- On microscopic examination, cystic spaces are lined by a double layer of neoplastic epithelial cells resting on a dense lymphoid stroma.
- Warthin's tumor is the 2nd most common salivary gland neoplasm (after pleomorphic adenoma).