Test Information

Test Name: SWT-PATHOLOGY-2017(MDMS)  Total Questions: 200
Test Type: Examination  Difficulty Level: Difficult
Total Marks: 800  Duration: 120 minutes

Test Question  Language:- ENGLISH

(1). Alpha fetoprotein is positive in all except

a. Yolk sac tumor
b. Choriocarcinoma
c. Pancreatic tumors with acinar differentiation
d. Bronchoalveolar carcinoma

Solution. (d) Bronchoalveolar carcinoma
Ref: Rosai and Ackerman, 10th edition)
Sol :
- Alpha-fetoprotein. This glycoprotein is a major plasma component of the fetus, the major sources being the liver and the visceral endoderm of the yolk sac. It is one of the major oncofetal antigens.
- It is invariably present in yolk sac (endodermal sinus) tumors and also in a high proportion of other germ cell tumors.
- It is also present in hepatocytic and hepatoid neoplasms, in pancreatic tumors with acinar cell differentiation, and in a variety of carcinomas with germ cell-like features.

Correct Answer. d

(2). All of the following are circumscribed tumors in salivary gland except

a. Adenoid cystic carcinoma
b. Pleomorphic adenoma
c. Basal cell adenoma
d. Warthin tumor

Solution. (a) Adenoid cystic carcinoma
- Ref: Diagnostic Histopathology of Tumors, 4th edition)
- Sol :

Correct Answer. a
(3). Which of the following is true about DICER enzyme?

a. It is an exoribonuclease
b. Cleaves ssRNA
c. Mutations seen in Sertoli Leydig Cell Tumor
d. Produces miRNA of 50-65 nucleotides long

Solution. (c) Mutations seen in Sertoli Leydig Cell Tumor
Ref: Read the text below
Sol:
Dicer, also known as endoribonuclease Dicer or helicase with RNase motif, is an enzyme that in humans is encoded by the DICER1 gene. Being part of the RNase III family, Dicer cleaves double-stranded RNA (dsRNA) and pre-microRNA (pre-miRNA) into short double-stranded RNA fragments called small interfering RNA and microRNA, respectively. These fragments are approximately 20-25 base pairs long with a two-base overhang on the 3' end. Dicer facilitates the activation of the RNA-induced silencing complex (RISC), which is essential for RNA interference. RISC has a catalytic component argonaute, which is an endonuclease capable of degrading messenger RNA (mRNA). SLCT is the most frequent gonadal tumour associated with DICER1 mutation, but juvenile granulosa cell tumour and gynandroblastoma can also show similar mutations.

Correct Answer. c

(4). Anaplastic Astrocytoma is characterised by

a. Necrosis
b. Microvascular proliferation
c. Increased cellularity
d. Increased mitotic activity

Solution. (d) Increased mitotic activity
Ref: Washington Manual of Surgical Pathology, 2nd edition
Sol:
- Gliomas are graded on the basis of their cellularity, presence of nuclear atypia, mitotic activity, presence of necrosis and endovascular proliferation.
- Anaplastic astrocytomas (WHO Grade III) are characterised by increased mitotic activity.
- Grade I tumors have increased cellularity but absence of the other features mentioned above.
- Grade II tumors have increased nuclear atypia but no evidence of increased mitosis. Necrosis and endovascular proliferation characterise Grade IV tumors.

Correct Answer. d

(5). All are true about type II pneumocytes except:

a. Constitute about 5% of the alveolar epithelium
b. Flattened plate like
c. Synthesize surfactant
d. Can give rise to type I pneumocytes

Solution. (b) Flattened plate like
Ref: Reference Robbins 9th edition, page 670
Sol:
- Alveolar epithelium, a continuous layer of two cell types flattened, platelike type I pneumocytes, covering 95% of the alveolar surface, and rounded type II pneumocytes.
- Type II cells synthesize surfactant (which forms a very thin layer over the alveolar cell membranes) and are involved in the repair of alveolar epithelium through their ability to give rise to type I cells.

Correct Answer. b
(6). The dangerous particle size causing pneumoconiosis varies from -

a. 100-150 um
b. 50-100 um
c. 10-50 um
d. 1-5 um

Solution. (d) 1-5 um
Ref.: Robbin’s - 696
Sol:
Pneumoconiosis
- Pneumoconiosis is an occupational lung disease caused by the inhalation of dust.
- The development of pneumoconiosis depends on -
  - The amount of dust retained in the lungs and airways.
  - The size, shape of the particles - The most dangerous particle ranges from 1 to 5 um in diameter because they may reach the terminal small airway and air sacs and settle in their linings.
  - Particle solubility and physiochemical reactivity.
  - Additional effects of other irritants (e.g. concomitant smoking.)

Correct Answer. d

(7). In renal disease, Albumin is first to appear in urine because-

a. Of its high concentration in plasma
b. Has molecular weight slightly greater than the molecules normally getting filtered
c. High Albumin: Globulin ratio
d. Tubular epithelial cells are sensitive to albumin

Solution. (b) Has molecular weight slightly greater than the molecules normally getting filtered
Ref.: Ganong - 709
Sol:
- “Albumin has the smallest molecular weight and size out of all the plasma proteins therefore it is particularly susceptible to be filtered via Glomerular filter.”
- The diameter of Albumin molecule is 7nm and the glomerular filtration layer allows particles of diameter 8nm to pass through it.
- The albumin starts appearing in urine as soon as the negative charge of filtration layer disappears.

Correct Answer. b

(8). Tamm Horsfall protein is produced by-

a. Ureter
b. Collecting duct
c. Loop of Henle
d. Distal tubule

Solution. (c) Loop of Henle
Ref.: Taylor 3rd/e p. 694
Sol:
- Tamm - Horsfall protein is a mucoprotein produced by thick ascending loop of henle.
Characteristics of Tamm-Horsfall protein:
  - It can be precipitated in the lumen in both pathological and physiological conditions.
  - It may be passed in the urine as hyaline casts
  - Tamm - Horsfall protein is best visualized in PAS stains.
  - Tamm - Horsfall protein can be found in abnormal sites such as proximal nephron, interstitium, vessels in certain disorders.

Correct Answer. c
(9). Which of these not cause crescentic glomerulo nephritis –

a. Rapidly progressive glomerulonephritis
b. Alport syndrome
c. Goodpasture syndrome
d. Henoch schonlein purpura

Solution. (b) Alport syndrome
Ref.: Robbin’s - 920
Sol :
- In 50% of cases, RPGN is associated with an underlying disease such as Goodpasture syndrome, systemic lupus erythematosus, or granulomatosis with polyangiitis; the remaining cases are idiopathic. Regardless of the underlying cause, RPGN involves severe injury to the kidneys’ glomeruli, with many of the glomeruli containing characteristic glomerular crescents (crescent-shaped scars)
- Because of this microscopic feature, RPGN is also called crescentic glomerulonephritis

Correct Answer. b

(10). A female patient nandini presents with upper respiratory tract infection. Two days after. She develops hematuria. Probable diagnosis is –

a. IgA nephropathy
b. Wegner’s granulomatosis
c. Henoch sholein purpura
d. Post streptococcal glomerulonephritis

Solution. (a) IgA nephropathy
Ref.: Robbin’s - 931
Sol :

| DIFFERENTIATING FEATURES B/W IGA NEPHROPATHY AND POSTSTREPTOCOCCAL G.N. |
|-----------------------------|-----------------------------|
| IgA nephropathy             | Poststreptococcal glomerulonephritis |
| Onset of hematuria 2-4 days after URTI | Onset of hematuria 7-21 days following URTI and skin infection |
| Serum complement C3 normal | Serum complement C3 decreased |
| Recurrence common           | Recurrence rate, one attack confers life long immunity |
| No elevation of antibody titre | Elevation of antistreptococcal antibody titre |

Correct Answer. a

(11). Which component or HBV causes glomerulonephritis –

a. Hbe Ag.
b. HBc Ag.
c. HBs Ag.
d. Anti HBs Ag antibody

Solution. (a) Hbe Ag.
Ref.: Harrison - 1938
Sol :
- Immune complex mediated tissue damage is the cause of glomerulonephritis in the host.
- Immune complex consists Hbs Ag and antiHBs.
- Hbs Ag is a structural component HBV, while Anti Hbs Ag is formed by the host
- So, Hbs Ag is the component of HBV that is responsible for glomerulonephritis.

Correct Answer. a
(12). All of the following are associated with low complement levels except-

a. Lupus nephritis
b. Mesangio capillary glomerulonephritis
c. Diarrhea associated hemolytic uremic syndrome
d. Glomerulonephritis related to bacterial endocarditis

Solution. 12. (c) Diarrhea associated hemolytic uremic syndrome
Ref.: Read the text below
Sol :
- Lupus Nephritis, post streptococcal glomerulonephritis and membrano proliferative glomerulonephritis are all associated with low complement levels

Correct Answer. c

(13). The Electron Microscopy is virtually diagnostic in renal biopsy study of

a. Goodpasture’s syndrome
b. Churg-Strauss Syndrome
c. Alport syndrome
d. Wegner’s granulomatosis

Solution. (c) Alport syndrome
Ref.: Robbin’s - 932
Sol :
- Alport’s syndrome presents with characteristic histological features on electron microscopy.
- Such changes may present in other diseases, but are most pronounced and widespread in Alport’s syndrome.
- Features of Alport’s syndrome on electron microscopy:
  - Alport’s patients early in their disease typically have diffuse thinning of the basement membrane which thickens over time into multilamellous surrounding lucent areas that often contain granules of varying density.
  - The characteristic electron electron microscopic finding of fully developed disease is that glomerular basement membrane shows irregular foci of thickening alternating with attenuation (thinning) with pronounced splitting and lamination of lamina densa often with distinctive basket weave appearance.

Correct Answer. c

(14). Renal papillary necrosis is almost always associated with one of the following conditions -

a. Diabetes – mellitus
b. Analgesic – nephropathy
c. Chronic pyelonephritis
d. Post streptococcal GN

Solution. (a) Diabetes – mellitus
Ref.: Dorlands Illustrated Medical Dictionary 28th / e.p. 1104
Sol :
- ‘Renal papillary necrosis, an accompaniment of acute pyelonephritis is most often seen in diabetics and is characterized by necrosis of renal papillae of one or both kidneys with shaped demarcation between necrotic and living tissue’.

Correct Answer. a
(15). Eosinophiluria is seen in

a. PAN
b. Microscopic polyangitis
c. Interstitial nephritis
d. Atherothrombotic emboli

Solution. (c) Interstitial nephritis
Ref.: Love & Bailey - 1316
Sol:
Causes of eosinophiluria
- Acute allergic interstitial nephritis
- Schistosomiasis
- Rapidly progressive glomerulonephritis
- Chronic pyelonephritis
- Acute glomerulonephritis
- Graft rejection acute phase
- Ig A nephropathy, Henoch - Schonlein purpura
- Athroembolic renal disease
- Prostatitis

Correct Answer. c

(16). When carcinoma of stomach develops secondarily to pernicious anemia, it is usually situated in the

a. Prepyloric region
b. Pylorus
c. Body
d. Fundus

Solution. (d) Fundus
Ref.: Robbins = 263
Sol:
- Pernicious anemia is associated with autoimmune atrophic gastritis affecting the fundic glands. Intestinal metaplasia (premalignant for gastric carcinoma), is characteristically seen in this area of atrophic gastritis.
- Atrophic glands with extensive intestinal metaplasia are most characteristically confined to the fundus in patients with pernicious anaemia.

Correct Answer. d

(17). Histologic examination of the lesion in stomach reveal fat-laden cells, likely causes is

a. Lymphoma
b. Postgastrectomy
c. Signet-cell carcinoma stomach
d. Atrophic gastritis

Solution. (b) Postgastrectomy
Ref.: Read the text below
Sol:
- Lipid – laden macrophages (foam cells) are seen in xanthomatosis of stomach. Xanthomatosis of stomach
- It is characterized by collection of lipid laden macrophages (foam cells) forming plaques or nodules.
- Gastric xanthomatasis is more common in patients with:
  - Gastritis
  - Gastric ulcer
  - Deudenogastric reflex after gastric surgery.

Correct Answer. b
Which of the following is not true regarding superantigens

a. Bind T cells irrespective of antigen specificity of TCR

b. Bind directly to both MCH and T cell receptor causing T cell activation

c. Bind to cleft (or antigen binding groove) in the MCH II molecule

d. Binds directly to lateral aspect of T cell receptor

Solution. (c) Bind to cleft (or antigen binding groove) in the MCH II molecule

Ref.: Harrison - 2034

Superantigens:
- Superantigens are potent activators of T-lymphocytes.
- Superantigens stimulate very large numbers of T cells, without relation to their epitope specificity. This leads to an excessive and dysregulated immune response with release of cytokines IL-1, IL-2, TNF-α and IF-γ.
- Conventional antigens bind to MHC class I or II molecules in the groove of the αβ dimer (T cell receptor). In contrast, superantigen bind directly to the lateral portion of TCR β chain and MHC class II β chain, and stimulate T cells solely on γβ gene segment utilized independent of the D, J and γα - sequences present →γβ restricted T cell mitogens.
- Superantigens are capable of activating up to 20% of the peripheral T-cell pool, whereas conventional antigens activate < 1 in 10,000.
- For superantigens, antigen specificity of TCR is not required.

Correct Answer. c

A 35 year old lady complains dysphagia, Raynaud’s phenomenon, sclerodactyly. Investigations show antinuclear antibody. The likely diagnosis is

a. Systemic lupus erythematosus

b. Systemic sclerosis

c. Mixed connective tissue disorder

d. Rheumatoid arthritis

Solution. (b) Systemic sclerosis

Ref.: Harrison - 2097

Sol:
- Dysphagia, Raynaud’s phenomenon, sclerodactyly in 35 years old lady suggest the diagnosis of systemic sclerosis.

Correct Answer. b
Major fibril protein in Primary Amyloidosis is

a. AL
b. AA
c. Transthyretin
d. Procalcitonin

Solution. (a) AL
Ref.: Robbin’s - 250
Sol:

<table>
<thead>
<tr>
<th>Amyloid protein</th>
<th>Precursor</th>
<th>Syndrome or involved tissue</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>Immunoglobulin light chain</td>
<td>Primary, Myeloma associated</td>
</tr>
<tr>
<td>AA</td>
<td>Serum AA (SAA)</td>
<td>Reactive, Chronic inflammatory condition</td>
</tr>
<tr>
<td>Aβ2m</td>
<td>β2 microglobulin</td>
<td>Hemodialysis</td>
</tr>
<tr>
<td>AA</td>
<td>SAA</td>
<td>Familial Mediterranean fever</td>
</tr>
<tr>
<td>ATTR</td>
<td>Transthyretin</td>
<td>Familial amyloidotic polyneuropathies</td>
</tr>
<tr>
<td>ATTR</td>
<td>Transthyretin</td>
<td>Systemic senile Amyloidosis</td>
</tr>
</tbody>
</table>

Correct Answer. a
(21). Amyloid stroma is seen in
   a. Papillary ca. thyroid
   b. Follicular ca. thyroid
   c. Anaplastic ca. thyroid
   d. Medullary ca. thyroid

   Solution. (d) Medullary ca. thyroid
   Ref: Read the text below

   **Sol:**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Protein featured</th>
<th>Official abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer's disease</td>
<td>Beta amyloid[7][8][9]</td>
<td>Aβ</td>
</tr>
<tr>
<td>Diabetes mellitus type 2</td>
<td>IAPP (Amylin)[10][11]</td>
<td>AIAPP</td>
</tr>
<tr>
<td>Parkinson's disease</td>
<td>Alpha-synuclein[8]</td>
<td>none</td>
</tr>
<tr>
<td>Transmissible spongiform encephalopathy e.g.</td>
<td>PrP²⁰[12]</td>
<td>APrP</td>
</tr>
<tr>
<td>Bovine spongiform encephalopathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatal Familial Insomnia</td>
<td>PrP²⁰</td>
<td>APrP</td>
</tr>
<tr>
<td>Huntington's Disease</td>
<td>Huntingtin[13][14]</td>
<td>none</td>
</tr>
<tr>
<td>Medullary carcinoma of the thyroid</td>
<td>Calcitonin[15]</td>
<td>ACal</td>
</tr>
<tr>
<td>Cardiac arrhythmias, Isolated atrial amyloidosis</td>
<td>Atrial natriuretic factor</td>
<td>AANF</td>
</tr>
<tr>
<td>Atherosclerosis</td>
<td>Apolipoprotein Ain</td>
<td>AApoA1</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>Serum amyloid A</td>
<td>AA</td>
</tr>
<tr>
<td>Aortic medial amyloid</td>
<td>Medin</td>
<td>AMed</td>
</tr>
<tr>
<td>Prolactinomas</td>
<td>Prolacti</td>
<td></td>
</tr>
</tbody>
</table>

   Correct Answer. d

(22). The expression of the following oncogene is associated with a high incidence of Medullary carcinoma of thyroid
   a. P 53
   b. Her 2 neu
   c. RET protooncogene
   d. Rb gene

   Solution. (c) RET protooncogene
   Ref: Robbin's - 281
   Sol:
   - RET protooncogene is a growth factor receptor (receptor tyrosine kinase)
   - The RET protein is a receptor for the glial cell lined derived neurotrophic factor and structurally releated proteins that promote cell
     survival during neural development.
   - RET is normally expressed in the following cells.
     - Parafollicular C ells of the thyroid
     - Adrenal medulla
     - Parathyroid cell precursors.

   Correct Answer. c
(23). Irreversible injury in MI occurs within:

- a. 40 min
- b. 10 min
- c. 60 min
- d. 90 min

**Solution.** (a) 40 min

**Ref:** Read the text below

**Sol:**

- **Irreversible injury occurs within 20-40 min**
- **Approximate Time of Onset of Key Events in Ischemic cardiac Myocytes**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset of ATP depletion</td>
<td>Seconds</td>
</tr>
<tr>
<td>Loss of contractility</td>
<td>&lt;2 min</td>
</tr>
<tr>
<td>ATP reduced</td>
<td></td>
</tr>
<tr>
<td>to 50% of normal</td>
<td>10 min</td>
</tr>
<tr>
<td>to 10% of normal</td>
<td>40 min</td>
</tr>
<tr>
<td>Irreversible cell injury</td>
<td>20-40 min</td>
</tr>
<tr>
<td>Microvasular injury</td>
<td>&gt;1 hr</td>
</tr>
</tbody>
</table>

**Correct Answer.** a

(24). All are true about extrinsic asthma except?

- a. Presents in childhood
- b. Family history of allergy/asthma present
- c. IgE levels increased
- d. Samter’s triad seen

**Solution.** (d) Samter’s triad seen

**Ref:** Read the text below

**Sol:**

- **Samter’s triad (asthma, aspirin sensitivity, and nasal polyps) is seen with intrinsic asthma**

<table>
<thead>
<tr>
<th>Atopic (Extrinsic) asthma</th>
<th>Non-atopic (intrinsic) asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1 hypersensitivity to extrinsic antigen</td>
<td>Non immune mediated response to intrinsic antigen</td>
</tr>
<tr>
<td>Presents at childhood</td>
<td>In adulthood</td>
</tr>
<tr>
<td>Family H/O and prior H/O of allergic disorders seen</td>
<td>No family H/O or prior allergic history</td>
</tr>
<tr>
<td>Serum IgE levels increased, skin test positive</td>
<td>IgE levels normal</td>
</tr>
<tr>
<td>Association with COPD not seen</td>
<td>Association with COPD seen</td>
</tr>
<tr>
<td>Eg. Atopic, occupational, ABPA</td>
<td>Eg. Aspirin, cold induced, exercise induced</td>
</tr>
</tbody>
</table>

**Correct Answer.** d
(25). PAS positive diastase resistant granules in intestine are seen in:

- a. Pseudomembranous colitis
- b. Whipple’s disease
- c. Tropical sprue
- d. Small bowel carcinoid

**Solution.** (b) Whipple’s disease
Ref.: Read the text below
Sol.: 
WHIPPLE’S DISEASE
- Chronic multisystem disease caused by a Gram-positive actinomycetes, Tropheryma whipplei
- The disease is more common in middle aged white men
Clinical features: The onset is insidious and is characterized by diarrhea, steatorrhea, abdominal pain, weight loss, migratory large joint arthropathy, fever, ophthalmic and CNS symptoms
- The development of dementia is a relatively late symptom and an extremely poor prognostic sign
- Culture negative endocarditis may be seen
- PAS positive diastase resistant granules in intestine are seen in Whipple’s disease.
- It is associated with presence of rod shaped bacteria.

**Correct Answer.** b

(26). All are features of tumor lysis syndrome except:

- a. Hypocalcemia
- b. Hyperkalemia
- c. Hypophosphatemia
- d. Hyperuricemia

**Solution.** (c) Hypophosphatemia
Ref.: Read the text below
Sol.: 
TUMOR LYSIS SYNDROME
Includes:
- Hyperuricemia
- Hyperkalemia
- Hyperphosphatemia
- Hypocalcemia
- Lactic acidosis
It is associated with:
- Hodgkin lymphoma
- All (most common)
- CLL
- Less commonly with solid tumors

**Correct Answer.** c
(27). All of the following are disorders due to defect in DNA recombination repair genes except:

a. Bloom syndrome  
b. Fanconi's anemia  
c. Xeroderma pigmentosum  
d. Ataxia telangiectasia

**Solution.** (c) Xeroderma pigmentosum  
Ref.: Read the text below  
Sol.:  
DEFECTS IN DNA REPAIR  
Homologous recombination:  
- Bloom syndrome  
- Rothmund Thompson syndrome  
- BRCA1 and 2 related cancers  
- Werner's syndrome  
- Ataxia telangiectasia  
Non homologous recombination:  
- SCID (severe combined immunodeficiency)  
Mismatch repair  
- HNPCC (Lynch syndrome)  
Base excision repair  
- MUTHY associated adenomatous polyposis  
Nucleotide excision repair  
- Xeroderma pigmentosum  

**Correct Answer.** c

(28). Which of the following red cell abnormalities is most indicative of hemolysis?

a. Target cells  
b. Acanthocytes  
c. Schistocytes  
d. Basophilic stippling

**Solution.** (c) Schistocyte  
Ref: Read the text below  
Sol.:  
- Abnormalities of red cells can help to identify a disease process.  
- Schistocytes, which are red cell fragments, indicate the presence of hemolysis, and they can occur in haemolytic anemia, megaloblastic anemia, or severe burns.  
- Red cell shapes characteristic of hemolysis include triangular cells and helmet cells. Target cells (red cells with a central dark area) are the result of excess cytoplasmic membrane material and are found in patients with liver disease, such as obstructive jaundice, or in any of the hypochromic anemias.  
- Acanthocytes are irregularly spiculated red cells found in patients with abetalipoproteinemia or liver disease. Echinocytes, in contrast, have regular spicules (undulations) and may either be artifacts (crenated cells) or be found in hyperosmolar diseases such as uremia.  
- Basophilic stippling of red cells (irregular basophilic granules within erythrocytes) varies from fine granules, seen in young reticulocytes (polychromatophilic cells), to coarse granules seen in diseases with impaired hemoglobin synthesis, such as lead poisoning and megaloblastic anemia.  
- Heinz bodies are formed by denatured haemoglobin and are not seen with routine stains. They are found in patients with glucose 6-phosphatase dehydrogenase deficiency and the unstable haemoglobinopathies.  

**Correct Answer.** c
(29). Which of the following types of emphysema cause significant airflow obstruction?

a. Centriacinar
b. Paraseptal
c. Panacinar
d. Irregular

Solution. (a) Centriacinar
Ref: Read the text below
Sol :
- Based on the segments of the respiratory units that are involved, emphysema is classified into four major types: (1) centriacinar, (2) panacinar, (3) paraseptal, and (4) irregular. Of these, only the first two cause clinically significant airflow obstruction.
[Extra Edge: Centriacinar emphysema is the most common form, constituting more than 95% of clinically significant case]

Correct Answer. a

(30). A specimen from a lung biopsy reveals occasional plexiform lesions within pulmonary arterioles. This abnormality is most characteristic of

a. Churg-Strauss syndrome
b. Adult respiratory distress syndrome
c. Wegener’s granulomatosis
d. Pulmonary hypertension

Solution. (d) Pulmonary hypertension
Ref: Read the text below
Sol :
- Pulmonary vascular sclerosis refers to the vascular changes associated with pulmonary hypertension.
- Elevation of the mean pulmonary arterial pressure is the result of endothelial dysfunction and vascular changes.
- The vascular changes vary with the size of the vessel. The main arteries have atheromas that are similar to systemic atherosclerosis, but are not as severe.
- Medium-sized arteries show intimal thickening and neomuscularization.
- Smaller arteries and arterioles show intimal thickening, medial hypertrophy, and reduplication of the internal and external elastic membranes.
- A distinctive arteriolar change, a plexiform lesion, consists of intraluminal angiomatous tufts that form webs. This pattern is thought to be diagnostic of primary hypertension.

Correct Answer. d

(31). Subendothelial deposits in glomerulus are seen in which of the following glomerulonephropathies?

a. MPGN
b. PSGN
c. Minimal change disease
d. FSGS

Solution. (a) MPGN
Ref: Read the text below
Sol :
MEMBRANOPROLIFERATIVE GLOMERULONEPHROPATHY
- The glomeruli are large and hypercellular due to proliferation of cells in the mesangium and endocapillary proliferation involving capillary endothelium and infiltrating leukocytes
- Crescents are present in many cases
- The glomerular capillary wall shows a “double-contour” or “tram – track” appearance (GBM splitting)
- Type 1 MPGN : Characterized by the presence of discrete subendothelial electron-dense deposits.
- By immunofluorescence, C3 is deposited in a granular pattern, and IgG and early complement components (C1q and C4) are often also present.

Correct Answer. a
(32). Metastatic calcification seen in all except:

a. Multiple myeloma
b. Breast cancer
c. Atherosclerosis
d. Renal failure

Solution. (c) Atherosclerosis
Ref.: Read the text below

Sol:
Metastatic calcification almost always results secondary to disturbances in calcium metabolism. Hypercalcemia also accentuates dystrophic calcification. It is seen in tissues which have propensity to lose acid. It affects:
- Alveolar walls of lungs (most common site)
- Gastric mucosa
- Pulmonary veins
- Systemic arteries
- Kidneys

Conditions associated with metastatic calcification:
- Primary tumors of bone marrow
- Skeletal metastasis
- Leukemia
- Paget’s disease
- Sarcoidosis
- William’s syndrome
- Renal failure

Correct Answer. c
(33). All are good prognostic factors in neuroblastoma except:

a. Stage 4S
b. Trk A expression
c. Trk B expression
d. Age < 18 months

Solution. (c) Trk B expression
Ref.: Read the text below
Sol:

- **Trk A expression is associated with good prognosis;**
- **Trk B expression is associated with unfavorable prognosis**

### PROGNOSTIC FACTORS FOR NEUROBLASTOMA

<table>
<thead>
<tr>
<th>Variable</th>
<th>Favourable</th>
<th>Unfavourable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt;18 months</td>
<td>&gt; 18 months</td>
</tr>
<tr>
<td><strong>Histology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Evidence schwannian stroma and gangliocytic differentiation</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>- Mitosis; Karyorrhexis index</td>
<td>&lt;200/5000</td>
<td>&gt;200/5000</td>
</tr>
<tr>
<td>DNA Ploidy</td>
<td>Hyperdiploid or near triploid</td>
<td>Near diploid</td>
</tr>
<tr>
<td>N-Myc amplification</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Trk A expression</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Trk B expression</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Telomerase expression</td>
<td>Low/absent</td>
<td>Highly expressed</td>
</tr>
<tr>
<td>1p loss</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>11q loss</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>17q loss</td>
<td>Absent</td>
<td>Present</td>
</tr>
</tbody>
</table>

Correct Answer. c

(34). Bronchiolitis obliterans is pathognomonic of which type of lung transplant rejection?

a. Acute
b. Hyperacute
c. Chronic
d. Transfusion related acute lung injury (TRALI)

Solution. (c) Chronic
Ref.: Read the text below
Sol:
- The transplanted lung is subject to two major complications: infection and rejection
- Acute rejection of the lung occurs to some degree in all patients despite routine immune suppression.
- It often occurs during the early weeks to months after surgery but may occur years later whenever immune suppression is decreased.
- Chronic rejection is a significant problem in at least half of all lung transplant patients by 3 to 5 years.

Correct Answer. c
(35). Which of the following changes associated with shock may not revert back to normal?

a. Diffuse alveolar damage
b. Adrenal cortical lipid depletion
c. Acute tubular necrosis
d. Neuronal damage

Solution. (d) Neuronal damage
Ref.: Read the text below

Sol:

### Three Major Types of shock

<table>
<thead>
<tr>
<th>Type of Shock</th>
<th>Clinical Example</th>
<th>Principal Mechanisms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardiogenic</strong></td>
<td>Myocardial infarction, Ventricular rupture, Arrhythmia, Cardiac tamponade, Pulmonary</td>
<td>Failure of myocardial pump resulting from intrinsic myocardial damage, extrinsic pressure, or obstruction to outflow</td>
</tr>
<tr>
<td><strong>Hypovolemic</strong></td>
<td>Fluid loss (e.g. hemorrhage, vomiting, diarrhea, burns, or trauma)</td>
<td>Inadequate blood or plasma volume</td>
</tr>
<tr>
<td><strong>Septic</strong></td>
<td>Overwhelming microbial infections (bacterial and fungal), Superantigens (E.g., toxic shock syndrome)</td>
<td>Peripheral vasodilation and pooling of blood; endothelial activation/injury; leukocyte-induced damage, disseminated intravascular coagulation; activation of cytokine cascades</td>
</tr>
</tbody>
</table>

Correct Answer. d

(36). Most common primary tumor of heart is:

a. Myxoma
b. Rhabdomyoma
c. Fibroma
d. Lipoma

Solution. (a) Myxoma
Ref.: Read the text below
Sol:
- The most common primary cardiac tumors, in descending order of frequency (overall, including adults and children), are:
  - Myxomas, fibromas, lipomas, papillary fibroelastomas, rhabdomyomas, angiosarcomas, and other sarcomas
  - 90% are located in the atria (atrial myxomas), with a left-to-right ratio of approximately 4:1
  - The region of the fossa ovalis in the atrial septum is the favored site of origin
  - Myxomas elaborate IL-6 leading to constitutional symptoms like fever, weight loss, cachexia, malaise and arthralgias
  - 90% are sporadic, 10% familial with autosomal dominant transmission, which form part of carney complex

Correct Answer. a
(37). All are true regarding polycythemia vera except:

a. JAK2 mutation seen

b. Can cause venous thrombosis

c. Serum urea levels low

d. Normal erythropoietin levels

Solution. (c) Serum urea levels low

Ref.: Read the text below

Sol:

POLYCYTHEMIA VERA
- Serum urea levels are high due to high cell turn over in PV.
- Symptomatic gout is seen in 5-10% individuals
- Polycythemia vera is associated with activating point mutation in the tyrosine kinase JAK2

Clinical features include:
- Mostly discovered incidentally on routine hemogram
- Headache, dizziness
- Thrombosis: DVT, MI, mesenteric/hepatic/dural venous thrombosis
- Bleeding: due to defect in platelet function (can be minor or major bleeds)
- Hypertension
- Aquagenic pruritus
- GI ulcers (due to histamine release as a result of basophilia)
- Hyperuricemia/gout
- Massive splenomegaly

Correct Answer. c

(38). Which finding on electron microscopy indicates irreversible cell injury

a. Dilatation of endoplasmic reticulum.

b. Dissociation of ribosomes from rough endoplasmic reticulum.

c. Flocculent densities in the mitochondria

d. Myelin figures

Solution. (c) Flocculent densities in the mitochondria

Ref.: Robbins'-19

Sol:

Note:
- Earliest change of reversible cell injury is cellular swelling.
- Myelin figure (laminated structure) derived from damaged membrane of organelles and plasma membrane, first appear during reversible injury, but become more pronounced in irreversible injury.

Correct Answer. c

(39). Lipid peroxidation as a cause of ageing and injury of cells is –

a. Free radical theory

b. Apoptosis theory

c. Enzyme cascade theory

d. Cell destruction theory

Solution. (a) Free radical theory

Ref.: Robbins’ - 125

Sol:
- “Free radicals produced during injury or aging cause oxidative decomposition of lipid.
- Due to oxidative decomposition organic peroxides are formed after reacting with oxygen (Lipid peroxidation).
- This reaction is auto-catalytic i.e. new radicals are formed from the peroxide radicals themselves.
- These radicals cause structural and functional breakdown of endoplasmic reticulum.

Correct Answer. a
(40). ‘Popcorn-cells’ are seen in which variety of hodgkin’s disease

a. Nodular sclerosis
b. Mixed cellularity
c. Lymphocyte predominance
d. None

Solution. (c) Lymphocyte predominance
Ref.: Robbin’s - 619
Sol: - Popcorn cells are found in lymphocytic predominant type of Hodgkin’s Lymphoma.

Correct Answer. c

(41). Mantle cell lymphomas are positive for all of the following except-

a. CD23
b. CD20
c. CD5
d. CD43

Solution. (a) CD23
Ref.: Robbin’s - 613
Sol: - Mantle cell lymphoma
- Mantle cell lymphoma is a type of non-hodgkin lymphoma characterized by presence of tumor cells which closely resemble the normal mantle zone of B-cells that surround germinal centers.
- Immunophenotype of mantle cell lymphoma
- Mantle cell lymphoma is neoplasm of B cells.
- Therefore it expresses B cell marker:
  - CD19, CD20
  - Surface immunoglobulin heavy chain (IgM and IgD).
  - Either k or light chain.
- As the tumor cells are derived from Mantle zone, they are positive for B cell marker of mantle zone i.e. CD5.
- Mantle cell lymphoma is CD23 negative, this feature distinguishes it from chronic lymphocytic leukemia (CLL) which is positive for both CD5 and CD23.
- The other characteristic marker of mantle cell lymphoma is cycline D1.

Correct Answer. a
Which of the following does not have malignant potential

a. FAP
b. Juvenile Polyposis Syndrome
c. Peutz Jegher Syndrome
d. Juvenile Polyp

Solution. (d) Juvenile Polyp
Ref: Read the text below
Sol:
Juvenile Polyp:
- Majority occur in young age
- 80% Polyp occur in rectum
- They have got no malignant potential
Juvenile Polyposis Syndrome
- Autosomal dominant
- Multiple juvenile polyp in the gut
- Carry the risk of adenoma
Peutz Jeghers Syndrome
- Autosomal dominant
- 100% Polyp occur in the small intestine
- At these have got malignant potential

Correct Answer. d
(43). Which in not a B cell marker

a. CD 10  
b. CD 19  
c. CD 20  
d. CD 135

Solution. (d) CD 135  
Ref: Read the text below

Sol:

<table>
<thead>
<tr>
<th>Surface Antigen (Other Names)</th>
<th>Family</th>
<th>Molecular Mass, KDA</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD19 B4</td>
<td>Ig</td>
<td>95</td>
<td>B (except plasma cells), FDC</td>
</tr>
<tr>
<td>CD20 (B1)</td>
<td>Unassigned</td>
<td>33–37</td>
<td>B (except plasma cells)</td>
</tr>
<tr>
<td>CD21 (B2, CR2, EBV-R, c3dr)</td>
<td>RCA</td>
<td>145</td>
<td>Mature B, FDC, subset of thymocytes</td>
</tr>
<tr>
<td>CD22 (BL-CAM)</td>
<td>Ig</td>
<td>130–140</td>
<td>Mature B</td>
</tr>
<tr>
<td>CD23 (fcrII, B6, Leu-20, BLAST-2)</td>
<td>C-type lectin</td>
<td>45</td>
<td>B, M, FDC</td>
</tr>
</tbody>
</table>

Correct Answer. d
(44). Not a common cause of vasculitis in adult

a. HSP
b. Kawasaki disease
c. PAN
d. Giant cell arteritis

**Solution.** (b) Kawasaki disease

Ref: Read the text below

**Sol:**
Henoch-Schönlein Purpura
- Henoch-Schönlein purpura, also referred to as anaphylactoid purpura.
- It is a distinct systemic vasculitis syndrome that is characterized by palpable purpura (most commonly distributed over the buttocks and lower extremities).
- Arthralgias, gastrointestinal signs and symptoms are usually seen in children.
- Most patients range in age from 4 to 7 years; however.
- The disease may also be seen in infants and adults with symptoms, and glomerulonephritis. It is a small-vessel vasculitis.

Kawasaki Disease.
- Kawasaki disease, also referred to as mucocutaneous lymph node syndrome, is an acute, febrile, multisystem disease of children. Some 80% of cases occur prior to the age of 5, with the peak incidence occurring at 2 years.

Giant Cell Arteritis and Polymyalgia Rheumatica
- Giant cell arteritis, also referred to as cranial arteritis or temporal arteritis, is an inflammation of medium- and large-sized arteries.
- It characteristically involves one or more branches of the carotid artery, particularly the temporal artery.
- It is a systemic disease that can involve arteries in multiple locations, particularly the aorta and its main branches.
- Giant cell arteritis occurs almost exclusively in individuals >50 years. It is more common in women than in men.

**Correct Answer.** b

(45). Which immunoglobulins are characteristically present on mature (virgin) B cells, which are B lymphocytes that have not yet been exposed to the appropriate antigen?

a. IgD and IgA
b. IgE and IgG
c. IgG and IgM
d. IgM and IgD

**Solution.** (d) IgM and IgD

Sol: Developing B cells produce IgD and IgM which are also expressed on the cell surface. These cells with surface IgM and IgD are called mature B cells.
- They are also called “virgin” B cells because these cells have not encountered any foreign antigen.

**Correct Answer.** d
(46). An autopsy is performed on an 82-year-old female diagnosed with Alzheimer disease. Which of the following is most likely to be found on evaluation of her brain?

a. Fibrosis
b. Necrosis
c. Senile plaques
d. Calcifications

Solution. (c) Senile plaques
Ref: Read the text below
Sol:
- Senile plaques are the most conspicuous histologic lesion also known as neuritic plaque, constitute a spherical deposit of A fragments (amyloid beta fragments) of variant degree length.
- They are surrounded by reactive astrocytes, microglia, and display alpha-synuclein immunoreactive neuronal process.

Correct Answer. c

(47). A 60-year-old male presents with a growth on the inside of his lower lip. It has been present for several months and is slowly growing. He is a nonsmoker but has a long history of chewing tobacco. Which of the following is the most likely to be found on biopsy of the lesion?

a. Adenocarcinoma
b. Basal cell carcinoma
c. Carcinoid tumor
d. Squamous cell carcinoma

Solution. (d) Squamous cell carcinoma
Ref: Read the text below
Sol:
- Squamous cell carcinoma is the most common malignant tumor of the oral mucosa and may occur at any site.
- It most frequently involves the tongue, followed in descending order by the floor of the mouth, alveolar mucosa, palate, and buccal mucosa. The male to female ratio is 2:1 for the gum, but 10:1 for the lip.
- There are substantial variations in the geographical distribution of the oral cancer. For example, it is the single most common cancer of men in India.

Correct Answer. d

(48). The most common benign neoplasm of the breast?

a. Fibroadenoma
b. Hemangioma
c. Intraductal papilloma
d. Phyllodes tumor, benign

Solution. (a) Fibroadenoma
Ref: Read the text below
Sol:
- Fibroadenoma is the most common benign neoplasm of the breast and is composed of two types of tissues.
- A mesenchymal element most commonly composed of edematous or collagenized fibrous tissue and an epithelial component, which consists of compressed, and sometimes hyperplastic, irregular ductal lumens.
- They are usually found in young women and may be hormonally reactive during pregnancy or menopause.

Correct Answer. a
(49). Which one of the listed statements best characterizes the renal abnormality described as Kimmelstiel-Wilson disease?

a. Amyloid nephrosis
b. Capsular drops
c. Glycogen nephrosis
d. Nodular glomerulosclerosis

Solution. (d) Nodular glomerulosclerosis
Ref: Read the text below
Sol: - Diabetes may produce abnormalities that affect any part of the kidney, such as the glomerulus, the blood vessels (benign nephrosclerosis), the tubules (Armanni-Ebstein lesions, which refers to vacuolization of the cells of the proximal convoluted tubules), the interstitium, and the pelvis (infection leads to pyelonephritis and acute papillary necrosis).
- Diabetic lesions of the glomerulus include capillary basement thickening, diffuse glomerulosclerosis (increase in mesangium and mesangial cells), and nodular glomerulosclerosis.

Correct Answer. d

(50). Deletion of both Rb (retinoblastoma) genes in the same developing cell is most characteristically associated with the development of

a. Blue sclera
b. No iris
c. Subluxed lens
d. White pupil

Solution. (d) White pupil
Ref: Read the text below
Sol: - Retinoblastoma is the most common malignant tumor of the eye in children. Clinically, retinoblastoma may produce a white pupil (leucoria).
- This is seen most often in young children in the familial form of retinoblastoma, which is due to a deletion involving chromosome 13.
- These familial cases of retinoblastoma are frequently multiple and bilateral, although like all the sporadic, nonheritable tumors they can also be unifocal and unilateral. Histologically, rosettes of various types are frequent (similar to neuroblastoma and medulloblastoma).
- There is a good prognosis with early detection and treatment; spontaneous regression can occur but is rare.
- Retinoblastoma belongs to a group of cancers (osteosarcoma, Wilms tumor, meningioma, rhabdomyosarcoma, uveal melanoma) in which the normal cancer suppressor gene (antioncogene) is inactivated or lost, with resultant malignant change.

Correct Answer. d

(51). What is the earliest feature of chronic bronchitis?

a. Hypertrophy of submucosal glands
b. Mucus hypersecretion
c. Inflammation
d. Infection

Solution. (b) Mucus hypersecretion
Ref: Read the text below
Sol: - The earliest feature of chronic bronchitis is hypersecretion of mucus in the large airways, associated with hypertrophy of the submucosal glands in the trachea and bronchi.
[Extra Edge: The basis for mucus hypersecretion is incompletely understood, but it appears to involve inflammatory mediators such as histamine and IL-13]

Correct Answer. b
(52). Multiple small mucinous cysts of the endocervix that result from blockage of endocervical glands by overlying squamous metaplastic epithelium are called

a. Bartholin’s cysts  
b. Chocolate cysts  
c. Follicular cysts  
d. Nabothian cysts

**Solution.** (d) Nabothian cysts  
Ref: Read the text below  
Sol :  
- Obstruction of the ducts of any of the glands found within the female genitalia may cause the formation of a genital cyst.  
- The paired Bartholin’s glands, which are analogous to the bulbourethral glands of the male, are located in the lateral wall of the vestibule.  
- If these are obstructed, a cyst may form that is usually lined with transitional epithelium. Gartner’s duct cysts, derived from Wolffian (mesonephric) duct remnants, are located in the lateral walls of the vagina. Cysts derived from the same Wolffian duct may also be found on the lateral aspect of the vulva and are called mesonephric cysts.  
- Obstruction of the ducts of the mucous glands in the endocervix may result in small mucous (Nabothian) cysts.  
- Cysts may also be found within the skin of the vulva. These cysts, which contain white, cheesy material, are called keratinous (epithelial inclusion) cysts.  
- Clinically they are referred to as sebaceous cysts, which is a misnomer. Follicular cysts are benign cysts of the ovary, while “chocolate cysts” refers to cystic areas of endometriosis that include hemorrhages and blood clots.  

**Correct Answer.** d

(53). Where are acral lentiginous malignant melanomas most commonly located?

a. Groin and upper thighs  
b. Head and neck  
c. Mucosal membranes, especially the oral cavity  
d. Palms, soles, and subungual areas

**Solution.** (d) Palms, soles, and subungual areas  
Ref: Read the text below  
Sol :  
- Although malignant melanoma of the skin is not as common as squamous or basal cell carcinoma, it is an exceedingly important and somewhat mysterious tumor owing to its often devastating clinical course and occasionally unpredictable behavior.  
- There are basically four types of invasive malignant melanoma.  
- The most common type is the superficial spreading melanoma, which is characterized by its lateral (radial) growth and upward infiltration of malignant cells within the epidermis, having a “buckshot” appearance (Pagetoid cells).  
- Nodular melanomas are characterized by their dermal (vertical) growth and their minimal lateral (radial) growth.  
- Acral lentiginous melanoma is an uncommon type of melanoma that is characterized by its unique location on the palm, sole, or subungual area. Lentigomaligna melanoma, which is found in older individuals (mean age of 70 years), arises from a preexisting in situ lesion called a lentigo maligna (Hutchinson’s freckle).

**Correct Answer.** d

(54). Charcot Leyden Crystals are formed of an eosinophil protein called

a. Galectin 8  
b. Galectin 9  
c. Galectin 10  
d. Galectin 11

**Solution.** (c) Galectin 10  
Ref: Read the text below  
Sol :  
- Charcot Leyden Crystals are formed of an eosinophil protein called Galectin

**Correct Answer.** c
(55). Most common form of silica implicated in causation of fibrosis in silicosis is

a. Amorphous
b. Quartz
c. Cristobalite
d. Tridymite

Solution. (b) Quartz
Ref: Read the text below
Sol:
- Silica occurs in both crystalline and amorphous forms, but crystalline forms (including quartz, cristobalite, and tridymite) are much more fibrogenic.
- Of these, quartz is most commonly implicated.

Correct Answer. b

(56). Hypertension is most closely related to the formation of which one of the following types of aneurysms?

a. Berry aneurysm
b. Atherosclerotic aneurysm
c. Mycotic aneurysm
d. Charcot-Bouchard aneurysm

Solution. (d) Charcot-Bouchard aneurysm
Ref: Read the text below
Sol:
- Hypertension results in the deposition of lipid and hyaline material in the walls of cerebral arterioles, which is called lipohyalinosis.
- This weakens the wall and forms small Charcot-Bouchard aneurysms, which may eventually rupture.
- Berry aneurysms (small saccular aneurysms) are the result of congenital defects in the media of blood vessels and are located at the bifurcations of arteries.
- Atherosclerotic aneurysms are fusiform (spindle-shaped) aneurysms usually located in the major cerebral vessels.
- They rarely rupture, but may become thrombosed. Mycotic (septic) aneurysms result from septic emboli, most commonly from subacute bacterial endocarditis.

Correct Answer. d

(57). Low haptoglobin in hemorrhage is masked by concurrent presence of

a. Malnutrition
b. Pregnancy
c. Obstructive biliary disease
d. Liver parenchymal disease

Solution. (b) Pregnancy
Ref: Read the text below
Sol:
- Haptoglobin is an acute phase reactant (increases in inflammation and in pregnancy also. It increases in hemolytic anemia (not hemorrhage).
- Haptoglobin is reduced (because it binds to free Hb in plasma) but if there is any condition which increases haptoglobin levels then we call it as masking effect of haptoglobin (nothing but false negative test).
- Causes of masking of haptoglobin effect-any inflammatory condition like Rheumatic fever, TB or auto immune inflammatory diseases, malignancy (because inflammation) and pregnancy

Correct Answer. b
(58). Coal macules range in size from

a. 1-2 mm
b. 2-4 mm
c. 5-10 mm
d. 10-20 mm

Solution. (a) 1-2 mm
Ref: Read the text below
Sol:
- Coal macules range in size from 1-2 mm

Correct Answer. a

(59). A skin biopsy is being examined by a pathologist using light microscopy. Examining the tissue finds that the nuclei of the cells have a dark blue color while the cytoplasm of the cells have a pink color. Which one of the listed stains was most likely used to stain the nuclei a dark blue color in this specimen?

a. Acid Schiff
b. Eosin
c. Giemsa
d. Hematoxylin

Solution. (d) Hematoxylin
Ref: Read the text below
Sol:
- Hematoxylin is a basic dye that stains negatively charged structures, such as nucleic acids (ribosomes and the chromatin-rich nucleus), a dark blue-purple (basophilic) color.
- It is part of the H&E (hematoxylin and eosin) stain is the usual stain used by pathologists to examine tissue with light microscopy.
- Eosin is an acidic stain that stains positively charged structures a pink-red (eosinophilic) color. Most of the cytoplasm stains eosinophilic, while the nucleus stains basophilic.
- The periodic acid-Schiff (PAS) is primarily used to identify glycogen, while the Wright-Giemsa stain is used to stain blood to differentiate the blood cells.
- Finally mucicarmine stains acidic mucins a pink color.
- It can be used to identify neoplasms that form glandular structures

Correct Answer. d

(60). In an evaluation of an 8-year-old boy who has had recurrent infections since the first year of life, findings include enlargement of the liver and spleen, lymph node inflammation, and a superficial dermatitis resembling eczema. Microscopic examination of a series of peripheral blood smears taken during the course of a staphylococcal infection indicates that the bactericidal capacity of the boy’s neutrophils is impaired or absent. Which of the following is the most likely cause of this child’s illness?

a. Defect in the enzyme NADPH oxidase
b. Defect in the enzyme adenosine deaminase (ADA)
c. Defect in the IL-2 receptor
d. Developmental defect at the pre-B stage

Solution. -NA-

Correct Answer. a
(61). Which one of the listed cells is thought to be the source of hepatic stem cells?

a. Ito cells  
b. Limbus cells  
c. Oval cells  
d. Paneth cells

Solution. (c) Oval cells
Ref: Read the text below
Sol :
- Stem cells are unique cells that are characterized by their ability for asymmetric replication, which refers to the fact that one of the products of cell division is capable of self-renewal.
- Embryonic stem cells are pluripotent, that is, they are capable of forming all the tissues of the body, while adult stem cells are usually only able to differentiate into a particular tissue.
- Stem cells, which have been identified in many different tissues, are located in special sites called niches.
- For example, cells located in the canals of Hering of the liver can give rise to precursor cells called oval cells, which are capable of forming hepatocytes and biliary cells.
- Satellite cells, located in the basal lamina of myotubules, can differentiate into myocytes after injury, while limbus cells located in the canals of Schlemm are stem cells for the cornea.
- Other sites for stem cells are the base of the crypts of the colon and the dentate gyrus of the hippocampus.
- In contrast to stem cells, Ito cells, which are located in the subendothelial space of Disse, store vitamin A, and Paneth cells, located near the bottom of crypts, provide host defense against microorganisms.

Correct Answer. c

(62). A 35-year-old man living in a southern region of Africa presents with increasing abdominal pain and jaundice. He has worked as a farmer for many years, and sometimes his grain has become moldy. Physical examination reveals a large mass involving the right side of his liver. Which of the following substances is most closely associated with the pathogenesis of this lesion?

a. Aflatoxin B1  
b. Direct-acting alkylating agents  
c. Vinyl chloride  
d. Azo dyes

Solution. (a) Aflatoxin B1
Ref: Read the text below
Sol :
- Many chemicals are associated with an increased incidence of malignancy.
- These substances are called chemical carcinogens. Although there are direct-acting chemical carcinogens, such as the direct-acting alkylating agents that are used in chemotherapy, most organic carcinogens first require conversion to a more reactive compound.
- Polycyclic aromatic hydrocarbons, aromatic amines, and azo dyes must be metabolized by cytochrome P450-dependent mixed-function oxidases to active metabolites.
- Vinyl chloride is metabolized to an epoxide and is associated with angiosarcoma of the liver, not hepatocellular carcinoma.
- Azo dyes, such as butter yellow and scarlet red, are metabolized to active compounds that have induced hepatocellular cancer in rats, but no human cases have been reported. β-Naphthylamine is an exception to the general rule involving cytochrome P450, as the hydrolysis of the nontoxic conjugate occurs in the urinary bladder by the urinary enzyme glucuronidase. In the past there has been an increase in bladder cancer in workers in the aniline dye and rubber industries who have been exposed to these compounds.
- Aflatoxin B1, a natural product of the fungus Aspergillus flavus, is metabolized to an epoxide.
- The fungus can grow on improperly stored peanuts and grains and is associated with the high incidence of hepatocellular carcinoma in some areas of Africa and the Far East. Hepatitis B virus is also highly associated with liver cancer in these regions.

Correct Answer. a
(63). An autopsy is performed on a 64-year-old man who died of congestive heart failure. Sections of the liver reveal yellow-brown granules in the cytoplasm of most of the hepatocytes. Which of the following stains would be most useful to demonstrate with positive staining that these yellow-brown cytoplasmic granules are in fact composed of hemosiderin (iron)?

a. Oil red O stain  
b. Periodic acid–Schiff stain  
c. Prussian blue stain  
d. Sudan black B stain

Solution. (c) Prussian blue stain  
Ref: Read the text below  
Sol:  
- The differential for brown (or yellow-brown) granules in hepatocytes as seen with routine hematoxylin and eosin (H&E) stain includes hemosiderin, bile, and lipofuscin.  
- The special histologic stain for hemosiderin, which contains iron, is the Prussian blue stain. Hemosiderin stains blue with a Prussian blue stain.  
- Causes of excess iron deposition in the liver include hemosiderosis, which can result from excessive blood transfusions, and familial hemochromatosis, which results from excessive iron absorption from the gut.  
- In contrast, excess bile in the liver can be seen with jaundice, while lipofuscin deposition is seen with aging, cachexia, and severe malnutrition. In contrast to the Prussian blue stain, the oil red O stain and the Sudan black B stain are both used to demonstrate neutral lipids in tissue sections, while the PAS (periodic acid–Schiff) stain is used to demonstrate carbohydrates.  
- For example, glycogen is PAS-positive, and this staining characteristically is diastase-sensitive. Finally the trichrome stain is used to demonstrate collagen or smooth muscle in tissue.  
- With this stain collagen appears blue, while smooth muscle appears red.

Correct Answer. c

(64). A 37-year-old obese man presents with signs and symptoms of hyperglycemia. After appropriate workup, he is diagnosed as having type II diabetes mellitus, which is due in part to insulin resistance. Laboratory evaluation of his serum also finds hypertriglyceridemia, which is due to his diabetes. The most common type of secondary hyperlipidemia associated with diabetes mellitus is characterized by elevated serum levels of which one of the following substances?

a. Chylomicrons  
b. High-density lipoproteins  
c. Intermediate-density lipoproteins  
d. Very-low-density lipoprotein

Solution. (d) Very-low-density lipoprotein  
Ref: Read the text below  
Sol:  
- Increased serum lipids (hyperlipidemia) may be a primary genetic defect or may be secondary to another disorder, such as diabetes mellitus, alcoholism, the nephrotic syndrome, or hypothyroidism.  
- Secondary hypertriglyceridemia in patients with diabetes mellitus usually occur secondary to increased blood levels of VLDL.  
- The reason for this is that with decreased levels of insulin with diabetes mellitus there is increased mobilization of free fatty acids from adipose tissue (increased lipolysis). This increases delivery of free fatty acids to the liver, which increases production and secretion of VLDL by the liver. This is a type IV hyperlipidemia pattern.  
- Ethanol can also produce a type IV pattern due to increased VLDL. This is because ethanol also increases lipolysis of adipose tissue, which increases delivery of free fatty acids to the liver.  
- Ethanol also increases the esterification of fatty acid to triglycerides in the liver and inhibits the release of lipoproteins from the liver.

Correct Answer. d
A 51-year-old woman presents with a long history of poorly controlled hypertension, diabetes mellitus, and signs of renal failure. During the workup of her disease, a renal biopsy is performed and reveals the lumens of the small blood vessels to be narrowed by uniform, homogenous, pink deposits within the walls of the vessels. No “onion skinning” or necrosis of blood vessels is seen. What is the best diagnosis?

a. Medial calcific sclerosis  
b. Arteriosclerosis obliterans  
c. Hyperplastic arteriolosclerosis  
d. Hyaline arteriolosclerosis

Solution. (d) Hyaline arteriolosclerosis  
Ref: Read the text below  
Sol:  
- Hypertension is associated with two forms of damage to small blood vessels: hyaline arteriolosclerosis and hyperplastic arteriolosclerosis.  
- Hyaline arteriolosclerosis, which is also a vascular complication of patients with diabetes mellitus, is presumably caused by leakage of plasma components across the endothelium.  
- These changes within the kidney are referred to as benign nephrosclerosis, in which the decreased blood supply causes loss of nephrons and a characteristic finely granular appearance to the kidney surface.  
- Hyaline arteriolosclerosis is associated with benign hypertension. In contrast, hyperplastic arteriolosclerosis is associated with malignant hypertension, which refers to dramatic elevations in systolic and diastolic blood pressure often resulting in early death from cerebral and brainstem hemorrhages.  
- Pathologically, the renal vessels demonstrate a concentric obliteration of arterioles by an increase in smooth-muscle cells and protein deposition in a laminar configuration (onion skinning) that includes fibrin material, which leads to total and subtotal occlusion of the vessels. These changes are called hyperplastic arteriolosclerosis.  
- Medial calcific sclerosis (Mönckeberg arteriosclerosis) is characterized by dystrophic calcification in the tunica media of muscular arteries. There is no narrowing of the lumen of the affected vessels.  
- Thromboangiitis obliterans (Buerger disease) is occlusion by a proliferative inflammatory process in arteries of heavy cigarette smokers and is often associated with HLA-A9,B5 genotypes.  
- Finally, the term “arteriosclerosis obliterans” refers to arteriosclerosis of the extremities (peripheral vascular disease)

Correct Answer. d

A 53-year-old man while in the hospital because of a serious motor vehicle accident develops signs of respiratory failure. A chest x-ray reveals a complete “white-out” of both lungs, while a chest CT scan reveals extensive bilateral ground-glass opacifications of the lung parenchyma consistent with diffuse alveolar damage. Laboratory evaluation finds severe hypoxemia that does not improve with 100% oxygen. Which of the following histologic abnormalities is most likely to be seen in a biopsy specimen taken from his lungs?

a. Charcot-Leyden crystals  
 b. Curschmann spirals  
 c. Gohn complexes  
 d. Hyaline membranes

Solution. (a) Hyaline membranes  
Ref: Read the text below  
Sol:  
- Diffuse damage to the alveolar wall is the initial and basic lesion in acute respiratory distress syndrome (ARDS).  
- Protein-rich edema fluid then leaks into the alveolar spaces and combines with fibrin and dead cells to produce hyaline membranes that line the alveoli.  
- These hyaline membranes are the characteristic histologic feature of ARDS. Other names for ARDS include adult respiratory failure, shock lung, traumatic wet lung, pump lung, and diffuse alveolar damage (DAD).  
- These many names reflect the fact that there are many different causes of adult respiratory distress syndrome including sepsis, pneumonia, infections (viral), aspiration, trauma, fat emboli, smoke inhalation, drug reaction or overdose, shock, and burns. This syndrome is characterized clinically by the rapid onset of severe, life-threatening respiratory insufficiency. In the acute edematous stage, the lungs are congested (pulmonary congestion) and show pulmonary edema with interstitial inflammation. Collapsed, airless pulmonary parenchyma is called atelectasis and can also be seen in ARDS.  
- In contrast, deposits of needle-like crystals from the membranes of eosinophils, called Charcot-Leyden crystals, can be seen in patients with asthma along with Curschman spirals, which are spirals of mucus formed from mucous plugs of the smaller airways that can be seen in microscopic examination of sputum smears.  
- A Ghon complex, which is seen in primary tuberculosis, consists of a subpleural lesion near the fissure between the upper and lower lobes and enlarged caseous lymph nodes that drain the pulmonary lesion, while plexiform lesions within pulmonary arterioles are diagnostic of pulmonary hypertension.

Correct Answer. a
A 44-year-old alcoholic man presents with fever and a productive cough with copious amounts of foul-smelling purulent sputum. Physical examination finds that changing the position of this individual produces paroxysms of coughing. Which of the following is the most likely cause of this patient’s signs and symptoms?

a. Esophageal cancer  
b. Esophageal reflux  
c. Myocardial infarction  
d. Pulmonary abscess

Solution. (d) Pulmonary abscess
Ref: Read the text below
Sol:
- A pulmonary abscess is a localized suppurative process within the pulmonary parenchyma that is characterized by tissue necrosis and marked acute inflammation.
- Possible causes of a lung abscess include aerobic and anaerobic streptococci, Staphylococcus aureus, and many gram-negative organisms.
- Aspiration more often gives a right-sided single abscess, because the airways on the right side are more vertical. Antecedent pneumonia gives rise to multiple diffuse abscesses.
- The abscess cavity is filled with necrotic suppurative debris unless it communicates with an air passage. Clinically an individual with a lung abscess will have a prominent cough producing copious amounts of foul-smelling, purulent sputum.
- Changes in position evoke paroxysms of coughing. There is also fever, malaise, and clubbing of the fingers and toes.
- With antibiotic therapy 75% of lung abscesses resolve. Complications of a lung abscess include pleural involvement (empyema) and bacteremia, which could result in brain abscesses or meningitis.

Correct Answer. d

A 61-year-old man presents because of recent problems he has had trying to read the newspaper. Physical examination finds mild blurring of his central vision along with drusen within Bruch membrane beneath the retinal pigment epithelium. What is the correct diagnosis?

a. Closed-angle glaucoma  
b. Fuchs dystrophy  
c. Macular degeneration  
d. Retinitis pigmentosa

Solution. (c) Macular degeneration
Ref: Read the text below
Sol:
- Age-related macular degeneration (ARMD) is the most common cause of irreversible vision.
- There are two basic types of ARMD: exudative (wet) and nonexudative (dry). Exudative ARMD is characterized by choroidal neovascular (CNV) membranes located under the retina.
- The nonexudative (atrophic) form of ARMD has atrophic and hypertrophic changes in the retinal pigment epithelium (RPE) along with deposits in Bruch membrane (drusen) beneath the RPE.
- Between 10% and 20% of the cases of dry ARMD will progress to wet ARMD. Symptoms of dry ARMD tend to be milder and include blurred central vision and problems with contrast. Wet ARMD have painless progressive blurring of their central vision that is more severe.
- The clinical term glaucoma refers to visual loss and changes in the optic disk that usually results from increased intraocular pressure. There are two basic types of glaucoma: open angle glaucoma and closed angle glaucoma.
- Open angle glaucoma is more common, while closed angle glaucoma results from obstruction to aqueous flow, usually at the angle between the iris and cornea. Acute angle closure may cause sudden eye pain and loss of vision when leaving a dark room (or with the use of mydriatics). Fuchs endothelial dystrophy is a type of corneal dystrophy that results from loss of endothelial cells on the inner portion of the cornea. Early in the disease process these endothelial cells produce basement membrane material, called guttata, which can be seen with slit-lamp examination.
- Eventual loss of endothelial cells leads to stromal edema of the cornea and loss of vision.
- In contrast, retinitis pigmentosa is a disease caused by the loss of cones and rods (begins at periphery) and leads to night blindness and loss of peripheral vision. Finally, retrolental fibroplasia refers to the formation of a fibrovascular mass behind lens.
- This abnormality, also called retinits of prematurity (ROP), is seen in premature infants who received high-dose oxygen.

Correct Answer. c
A 2-month-old male infant, who was born at term without any prenatal abnormalities, is being evaluated for possible visual problems. He is noted to have an abnormal white light reflex involving his right eye, and examination finds a large mass that has almost completely filled the posterior chamber of this eye. Which of the following cells are most likely to be seen proliferating in histologic sections from this mass?

a. Benign fibroblasts and endothelial cells
b. Foamy macrophages with cytoplasmic clear vacuoles
c. Plasmacytoid cells within a dense Congo red-positive stroma
d. Small cells forming occasional rosette structures

**Solution.** (c) Plasmacytoid cells within a dense Congo red-positive stroma

Ref: Read the text below

Sol :
- Retinoblastoma is the most common malignant tumor of the eye in children. Clinically, retinoblastoma may produce a white pupil (leucoria).
- This is seen most often in young children in the familial form of retinoblastoma, which is due to a deletion involving chromosome 13.
- These familial cases of retinoblastoma are frequently multiple and bilateral, although like all the sporadic, nonheritable tumors they can also be unifocal and unilateral. Histologically, rosettes of various types are frequent (similar to neuroblastoma and medulloblastoma).
- There is a good prognosis with early detection and treatment; spontaneous regression can occur but is rare.
- Retinoblastoma belongs to a group of cancers (osteosarcoma, Wilms tumor, meningioma, rhabdomyosarcoma, uveal melanoma) in which the normal cancer suppressor gene (antioncogene) is inactivated or lost, with resultant malignant change.
- Retinoblastoma and osteosarcoma arise after loss of the same genetic locus—hereditary mutation in the q1 4 band of chromosome 13. In contrast to the histologic appearance of retinoblastoma, a proliferation of benign fibroblasts and endothelial cells, which can form a retrolental mass, is seen with retinopathy of prematurity (ROP), a cause of blindness in premature infants that is related to the therapeutic use of high concentrations of oxygen.
- The presence of foamy macrophages with cytoplasmic clear vacuoles is not a specific histologic finding and can be seen with several disorders.
- Congo red-positive stroma, however, is characteristic of medullary carcinoma of the thyroid, while spindle-shaped cells with cytoplasmic melanin is characteristic of malignant melanoma, the most common primary intraocular malignancy of adults.

**Correct Answer.** c

A biopsy of an enlarged salivary gland from an individual with Sjögren’s syndrome is most likely to histologically reveal an extensive infiltrate of

a. Basophils
b. Eosinophils
c. Epithelioid cells
d. Lymphocytes

**Solution.** (d) Lymphocytes

Ref: Read the text below

Sol :
- Sjögren’s syndrome is characterized by dryness of the mouth (xerostomia) and eyes (keratoconjunctivitis sicca). Secondary Sjögren’s syndrome is associated with rheumatoidarthritis (RA), SLE, or systemic sclerosis.
- The primary form shows increased frequency of HLA-DR3, while association with RA shows a positive correlation with HLA-DR4.
- Anti-SSB antibodies are fairly specific, anti- SSA less so, and both may occur in SLE; rheumatoid factor is often present.
- Glomerular lesions are very rare, but a mild tubulointerstitial nephritis is quite common and may result in renal tubular acidosis.
- In addition to the usual dense, lymphoplasmacytic infiltrate of salivary glands, the lymph nodes may show a “pseudolymphomatous” appearance.
- True B cell lymphomas have developed with increased frequency in Sjögren’s syndrome.

**Correct Answer.** d
(71). A post mortem clot is most likely to

a. Grossly display features of recanalization

b. Grossly have lines of Zahn

c. Grossly have the appearance of “chicken fat” overlying “currant jelly”

d. Microscopically appear attached to the wall of the blood vessel

Solution. (c) Grossly have the appearance of “chicken fat” overlying “currant jelly” Ref: Read the text below
Sol:
- Thrombi may form within the heart, the arteries, or the veins.
- When formed within the heart or the arteries, thrombi may have laminations, called the lines of Zahn, formed by alternating layers of platelets admixed with fibrin, separated by layers with more cells.
- Mural thrombi within the heart are associated with myocardial infarcts and arrhythmias, while thrombi in the aorta are associated with atherosclerosis or aneurysmal dilatations.
- Arterial thrombi are usually occlusive; however, in the larger vessels they are not.
- Venous thrombi, which are almost invariably occlusive, are found most often in the legs, in superficial varicose veins or deep veins.
- Those of the larger outflow veins of the leg may embolize. It is important to be able to tell postmortem clots from venous thrombi.
- The postmortem clot is usually rubbery, gelatinous, and lacks fibrin strands and attachments to the vessel wall. Large post-mortem clots may have a “chicken fat” appearance overlying a dark “currant jelly” base.

Correct Answer. c

(72). In tissues affected by the predominant form of Niemann-Pick disease, which one of the following is found at abnormally high levels?

a. Sphingomyelin

b. Sphingomyelinase

c. Kerasin

d. Acetyl coenzyme A

Solution. (a) Sphingomyelin Ref: Read the text below
Sol:
- Sphingomyelin, a lipid composed of phosphocholine and a ceramide, is characteristically found in abnormally high concentrations throughout the body tissues of patients who have any one of the forms of Niemann-Pick disease.
- Division of this disease into five categories is generally accepted: type A, the acute neuronopathic form, is the one that has the highest incidence.
- The lack of sphingomyelinase in type A is the metabolic defect that prevents the hydrolytic cleavage of sphingomyelin, which then accumulates in the brain.
- Patients who have the type A form usually show hepatosplenomegaly at 6 months of age, progressively lose motor functions and mental capabilities, and die during the third year of life.

Correct Answer. a

(73). Which one of the listed processes is the most likely cause of an aneuploid karyotype?

a. A reciprocal translocation between two acrocentric chromosomes

b. Deletion of both ends of a chromosome with fusion of the damaged ends

c. Division of the centromere along a transverse plane

d. Failure of homologous chromosomes or paired chromatids to separate

Solution. (d) Failure of homologous chromosomes or paired chromatids to separate Ref: Read the text below
Sol:
- The normal human karyotype consists of 23 pairs of chromosomes, of which 22 are homologous pairs of autosomes and one pair is the sex chromosome.
- The number of chromosomes found in germ cells (23) is called the haploid number (n), while the number of chromosomes found in all of the remaining cells in the body (46) is called the diploid number (2n).
- Any exact multiple of the haploid number (n) is called euploid.

Correct Answer. d
Artificial surfactant is most likely to be used in the treatment of an infant with

- a. Hemolytic disease of the newborn
- b. Hyaline membrane disease
- c. Physiologic jaundice of the newborn
- d. Retrolental fibroplasia

**Solution.** (b) Hyaline membrane disease

Ref: Read the text below

Sol:
- A disorder in newborns that is histologically identical to ARDS is called neonatal respiratory distress syndrome [hyaline membrane disease (HMD)].
- HMD, which accounts for 20% of all deaths in the first 28 days of life, is basically a disease of premature infants; most affected infants weigh 1000 to 1500 g.
- Contributing factors in the development of HMD include diabetes in the mother (maternal diabetes with increased glucose causes increased fetal secretion of insulin, which inhibits the effects of steroids such as lung maturation and production of surfactant) and cesarean section.

**Correct Answer.** b

Von Willebrand’s disease is characterized by abnormal platelet aggregation when platelets are exposed to

- a. Aspirin
- b. Collagen
- c. Fibrinogen
- d. Ristocetin

**Solution.** (d) Ristocetin

Ref: Read the text below

Sol:
- Platelet aggregation studies are used to evaluate qualitative disorders of platelets. These tests measure the response of platelets to various aggregating agents, such as ADP, epinephrine, collagen, and ristocetin.
- ADP causes the initial aggregation of platelets (phase I). This is followed by activation of the platelets, which then release their own ADP, which further aggregates the platelets (phase II).
- Platelet aggregation may be caused by collagen, ADP, or ristocetin.
- In von Willebrand’s disease (vWD), aggregation induced by collagen and ADP is normal, but ristocetin is decreased.

**Correct Answer.** d
(76). A biopsy from a nasal lesion shows the following. What is your diagnosis?

a. Rhinosporidiosis
b. Capillary hemangioma
c. Aspergillosis
d. Paraganglioma

**Solution.** (a) Rhinosporidiosis

Ref: Read the text below

Sol :
- Rhinosporidiosis is an inflammatory disease endemic in India, but it has also been reported in other parts of the world.
- It is characterized by hyperplastic polypoid lesions of the nasal cavity and – rarely – other mucous membranes.
- The diagnosis is readily made by the identification of numerous globular cysts measuring up to 200 nm in diameter.
- Each of these cysts represents a thick-walled sporangium containing numerous spores. The precise nature of this organism remains enigmatic. Molecular studies indicate that Rhinosporidium seeberi clusters with a novel group of fish parasites referred to as the DRIP clade (Dermocystidium, rosette agent, Ichthyophonus, and Psorospermium), near the animal-fungal divergence.

**Correct Answer.** a

(77). TTF-1 is positive in all except

a. Thyroid tumors of follicular origin
b. Thyroid tumors of medullary origin
c. Lung carcinoma
d. Wilm’s tumor

**Solution.** (b) Thyroid tumors of medullary origin

Ref: Read the text below

Sol :
- Thyroid transcription factor 1 (TTF-1) has emerged as an extremely useful marker for thyroid follicular cells and tumors composed of them.
- The only other tissue in which it was thought to be consistently expressed was the alveolar epithelium of the lung.
- However, reports have recently appeared documenting its occasional presence in other sites, such as the normal and neoplastic female genital tract, Wilms tumor and Merkel cell tumor.

**Correct Answer.** b
Molecular groups of Medulloblastoma are classified on the basis of all of the following except

a. SHH pathway
b. Wnt pathway
c. KRAS mutations
d. N-MYC mutations

Solution. (c) KRAS mutations
Ref: Read the text below
Sol:
- The WNT type, characterized by mutations in the WNT signaling pathway, tends to occur in older children, has a classic medulloblastoma histology, and shows monosomy of chromosome 6 and nuclear expression of β-catenin. The prognosis is best in this subtype with 90% 5-year survival.
- The SHH type, characterized by mutations involving the sonic hedgehog signaling pathway, tends to occur in infants or young adults, tends to have a nodular desmoplastic histology and may have MYCN amplification. The prognosis is intermediate between the WNT subtype and groups 3 and 4.
- Group 3 medulloblastoma, often with MYC amplification and isochromosome 17 (i17q), tends to occur in infants and children, with a classic or large cell histology and the worst prognosis.
- Group 4 is characterized by an i17q cytogenetic alteration, classic or large cell histology, without MYC amplification, but sometimes with MYCN amplification. The prognosis in group 4 is intermediate. In general, isochromosome 17q signals a poor prognosis, and is restricted to groups 3 and 4.

Correct Answer. c

The following discoloration in thyroid is seen with which of the following

a. Minocycline
b. Chloramphenicol
c. Methotrexate
d. Chloroquine

Solution. (a) Minocycline
Ref: Read the text below
Sol:
- Accumulation of melanin-like pigment in the cytoplasm of follicular cells occurs in old age and may become massive after the administration of some medications, such as minocycline.
- When intense, it is appreciable grossly and is referred to as melanosis thyroïdi or – less pompously – as blackthyroid.
- Some of the granules are of classic lipofuscin type, but most of them also contain colloid, thus becoming amaryllysosomes.

Correct Answer. a
(80). Granulomas in liver are seen in response to injury by which of the following drugs except

a. Allopurinol
b. Sulfonamides
c. Methotrexate
d. Amiodarone

**Solution.** (c) Methotrexate
Ref: Read the text below
Sol: Granulomas in liver are seen in response to injury by following drugs:
- Allopurinol
- Sulfonamides
- Amiodarone

**Correct Answer.** c

(81). All of the following are true about paraneoplastic neuropathies except

a. Often precede the diagnosis of underlying tumor
b. Sensorimotor neuropathy is the most common form
c. Most commonly associated with squamous cell carcinoma of lung
d. Anti Hu and Anti CV2 antibodies are seen in these patients

**Solution.** (d) Anti Hu and Anti CV2 antibodies are seen in these patients
Ref: Read the text below
Sol: - Paraneoplastic neuropathies can occur at any time during the patient’s course, but often precede the diagnosis of the underlying tumor.
- Sensorimotor neuronopathy is the most common paraneoplastic form, but a chronic inflammatory demyelinating polyradiculoneuropathy-like picture, plexopathy, and autonomic neuropathy may also be seen.
- Paraneoplastic sensorimotor neuronopathy is most commonly associated with small cell lung cancer.
- Antibodies that recognize proteins expressed by cancer cells and normal neurons (for example anti-Hu antibodies) are often present, but the damage appears to be mediated by a CD8+ cytotoxic T-cell attack on dorsal root ganglion cells.
- Sensory symptoms usually start distally in an asymmetric and multifocal pattern.
- Other patients with so-called anti-CV2 autoantibodies (which recognize CRMP5, an intracellular signaling protein) tend to present with a mixed axonal and demyelinating sensorimotor neuropathy.

**Correct Answer.** d

(82). Which of the following are true about lung cancer in never smokers except?

a. Occur more commonly in women
b. Most are adenocarcinomas
c. More likely to have EGFR mutations
d. KRAS mutations are most common

**Solution.** (d) KRAS mutations are most common
Ref: Read the text below
Sol: - The WHO estimates that 25% of lung cancer worldwide occurs in never smokers.
- This percentage is probably closer to 10% to 15% in Western countries.
- These cancers occur more commonly in women and most are adenocarcinomas.
- Cancers in nonsmokers are more likely to have EGFR mutations, and almost never have KRAS mutations.
- TP53 mutations are not uncommon, but occur less frequently than in smoking related cancers.

**Correct Answer.** d
(83). Which of the following is/are true regarding lesions in pancreas in diabetes mellitus except?

a. More commonly seen with type 2
b. Reduction in number and size of islets in type 1
c. Principally T lymphocyte rich infiltrate is seen
d. Amyloid deposition is seen in type 2

Solution. (d) Amyloid deposition is seen in type 2
Ref: Read the text below
Sol: Lesions in the pancreas are inconstant and rarely of diagnostic value. Distinctive changes are more commonly associated with type 1 than with type 2 diabetes. One or more of the following alterations may be present:
• Reduction in the number and size of islets. This is most often seen in type 1 diabetes, particularly with rapidly advancing disease. Most of the islets are small and inconspicuous.
• Leukocytic infiltrates in the islets (insulitis) are principally composed of T lymphocytes, and are also seen in animal models of autoimmune diabetes.
• In type 2 diabetes there may be a subtle reduction in islet cell mass, demonstrated only by special morphometric studies.
• Amyloid deposition within islets in type 2 diabetes begins in and around capillaries and between cells.
• An increase in the number and size of islets is especially characteristic of nondiabetic newborns of diabetic mothers. Presumably, fetal islets undergo hyperplasia in response to the maternal hyperglycemia.

Correct Answer. d

(84). Which of the following types of vasculitis may show serum ANCA positivity:

a. Granulomatosis with polyangiitis
b. Leukocytoclastic vasculitis
c. Buerger disease
d. Giant cell arteritis

Solution. (a) Granulomatosis with polyangiitis
Ref: Read the text below
Sol: Granulomatosis with polyangiitis (GPA) Antineutrophil cytoplasmic antibody (ANCA) testing
- Cytoplasmic antineutrophil cytoplasmic antibody (c-ANCA) directed against PR3 is most specific for GPA
- Some patients with GPA express perinuclear-staining ANCA (p-ANCA) specific for myeloperoxidase (MPO)
- Combining immunofluorescence and ELISA enhances the sensitivity and specificity of a diagnosis of an ANCA-associated vasculitis (AAV) to 96% and 98.5%, respectively

Correct Answer. a
(85). The following biopsy from small intestine of a patient with HIV AIDS shows which of the following?

a. Trichuris
b. Trichinella
c. Cryptosporidium
d. Strongyloides

Solution. (d) Strongyloides
Ref: Read the text below
Sol:
- Strongyloidiasis is a parasitosis, which endoscopic and histopathologic presentations are very varied. It is mainly found in the duodenum, where the larva matures into adult female and induces varied patterns of inflammatory reactions.
- The most frequent endoscopic findings were swollen foldings of nodular aspect Severe duodenitis (according to the Jenkins classification) was found in 57% of the cases, and villi atrophy was found in all cases, most of them Grade 4 (according to the Drutt classification).
- Plasma cells did not decrease in severe duodenitis, unlike those reported on peptic duodenitis.

Correct Answer. d

(86). Which is the most common cytogenetic abnormality in adult myelodysplastic syndrome (MDS)?

a. Trisomy 8
b. 20q-
c. 5q-
d. Monosomy 7

Solution. (d) Monosomy 7
Ref: Read the text below
Sol:
'Myelodysplastic syndromes' are a group of clonal haematopoetic stem cell diseases characterized by dysplasia and ineffective hematopoesis in one or more of the major myeloid stem lines. The cytogenetic abnormalities in Adult myelodysplastic syndromes are Trisomy 8 10-15%
20 q- 3-5%
5 q- 20%
Monosomy 7 10-50%

Correct Answer. d
All of the following statements about Hairy cell leukaemia are true except:

a. Splenomegaly is conspicuous

b. Results from an expansion of neoplastic T lymphocytes

c. Cells are positive for Tartarate Resistant Acid Phosphatase

d. The cells express CD 25 consistently

**Solution.** (b) Results from an expansion of neoplastic T lymphocytes

Ref: Read the text below

Sol : Hairy cell leukemia is a 'B' cell neoplasm and is characterized by expansion of neoplastic B cells (not T lymphocytes)

Hairy cell leukemia:

Hairy cell leukemia is a rare but distinctive form of chronic B cell leukemia that derives its name from the appearance of fine 'hair like projections' on the leukaemic cells (large B cells)

<table>
<thead>
<tr>
<th>Characteristic cytochemical feature</th>
<th>Presence of tartrate resistant acid phosphatase ‘TRAP’ in neoplastic B cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cellular features/Markers</td>
<td>• Hairy cells express the pan B cell markers CD 19 and CD 20 and monocyte associated antigen CD 11</td>
</tr>
<tr>
<td></td>
<td>• Plasma cell associated antigen (PCA-1) is also present - Robbins</td>
</tr>
<tr>
<td></td>
<td>• Expression of CD 25, IL2 and specific adhesion molecules</td>
</tr>
<tr>
<td>• Clinical features</td>
<td>• Present predominantly in the older age group &gt;40 years</td>
</tr>
<tr>
<td>Result largely from</td>
<td>• Massive splenomegaly (hepatomegaly is less common)</td>
</tr>
<tr>
<td>infiltration of bone marrow, liver</td>
<td>• Lymphadenopathy</td>
</tr>
<tr>
<td>and spleen</td>
<td>• Pancytopenia</td>
</tr>
<tr>
<td></td>
<td>• Recurrent infections</td>
</tr>
</tbody>
</table>

| • Treatment                        | • Current treatment of choice is with purine analogues |
|                                     | – Cladribine |
|                                     | • Other drugs used |
|                                     | – Pentostatin |
|                                     | – Interferon α |
|                                     | • Splenectomy used to be the standard treatment earlier |

**Correct Answer.** b
Drug induced myopathy can be caused by all of the following except:

a. Atorvastatin.
b. D-penicillamine.
c. Ciprofloxacin.
d. Chloroquine.

**Solution.** (c) Ciprofloxacin.

Ref: Read the text below

**Sol:**

<table>
<thead>
<tr>
<th>(a) Class of Drug</th>
<th>(b) Mechanism of toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>lipid-lowering agents</td>
<td>asymptomatic serum creatine kinase elevation, myalgias, exercise-induced pain, rhabdomyolysis, and myoglobinuria.</td>
</tr>
<tr>
<td>Glucocorticoids</td>
<td>Acute, high-dose glucocorticoid treatment can cause acute quadriplegic myopathy. Chronic steroid administration produces predominantly proximal weakness.</td>
</tr>
<tr>
<td>Nondepolarizing neuromuscular blocking agents</td>
<td>Acute quadriplegic myopathy can occur with or without concomitant glucocorticoids.</td>
</tr>
<tr>
<td>(c) Zidovudine</td>
<td>Mitochondrial myopathy with ragged red fibers.</td>
</tr>
<tr>
<td>(d) Autoimmune toxic myopathy</td>
<td>Use of this drug may cause polymyositis and myasthenia gravis.</td>
</tr>
<tr>
<td>➢ D-Penicillamine</td>
<td></td>
</tr>
<tr>
<td>(e) Amphiphilic cationic drugs</td>
<td>All amphiphilic drugs have the potential to produce painless, proximal weakness associated with autophagic vacuoles in the muscle biopsy.</td>
</tr>
<tr>
<td>➢ Amiodarone</td>
<td></td>
</tr>
<tr>
<td>➢ Chloroquine</td>
<td></td>
</tr>
<tr>
<td>➢ Hydroxychloroquine</td>
<td></td>
</tr>
<tr>
<td>(f) Drugs of abuse</td>
<td>All drugs in this group can lead to widespread muscle breakdown, rhabdomyolysis, and myoglobinuria.</td>
</tr>
<tr>
<td>➢ Alcohol</td>
<td>Local injections cause muscle necrosis, skin induration, and limb contractures.</td>
</tr>
<tr>
<td>➢ Amphetamines</td>
<td></td>
</tr>
<tr>
<td>➢ Cocaine</td>
<td></td>
</tr>
<tr>
<td>➢ Heroin</td>
<td></td>
</tr>
<tr>
<td>➢ Phencyclidine</td>
<td></td>
</tr>
<tr>
<td>➢ Meperidine</td>
<td></td>
</tr>
<tr>
<td>(g) Antimicrotubular drugs</td>
<td>This drug produces painless, proximal weakness especially in the setting of renal failure. Muscle biopsy shows autophagic vacuoles.</td>
</tr>
<tr>
<td>➢ Colchicine</td>
<td></td>
</tr>
</tbody>
</table>

Correct Answer: c
(89). NK cells acts on virus-infected cells which are:-

a. Which express class I MHC

b. Which doesn’t express class I MHC

c. Which express class II MHC

d. Which doesn’t express class II MHC

Solution. (b) Which doesn’t express class I MHC

Ref: Read the text below

Sol :  
NK cell activity is  
- Nonimmune (i.e., effector cell never having had previous contact with the target)  
- MHC-unrestricted,  
- Non-antibody-mediated killing of target cells which are usually malignant cell types, transplanted foreign cells, or virus-infected. 

The ability of NK cells to kill target cells is inversely related to target cell expression of MHC class I molecules. Thus, NK cells kill target cells with low or no levels of MHC class I expression are prevented from killing target cells with high levels of class I expression. When cell-surface levels of host MHC class I molecules decrease, such as occurs during malignant transformation or viral infection of host cells, the altered host cell with diminished MHC class I expression is recognized by NK, and the NK cell is activated to kill the host tumor or virally infected cells. In this manner, NK cells can detect and recognize stressed virally infected cells for elimination.

Correct Answer. b

(90). Basal cell carcinoma commonly spreads by :

a. Lymphatic 

b. Haematogenous 

c. Direct spread 

d. All the above

Solution. (c) Direct spread

Ref: Read the text below

Sol :  
- Most common mode of spread of BCC is “Direct”.  
- Metastatic spread is most often to lymph nodes, lungs, and bones with lymphogenic and hematogenic spread equally frequent.  
- Age of sex of the patient seemed to have no influence on survival or way of metastatic spread.  
- Metastasis of basal cell carcinoma is extremely rare (1 in 1,000 to 35,000)

Correct Answer. c

(91). The following is not a feature of Alzheimer’s disease :

a. Neurofibrillary tangles 

b. Senile (neuritic) plaques 

c. Amyloid angiopathy 

d. Lewy bodies

Solution. (d) Lewy bodies

Ref: Read the text below

Sol :

<table>
<thead>
<tr>
<th>Disease</th>
<th>Region affected</th>
<th>Main features</th>
<th>Predominant pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s disease</td>
<td>Cerebral cortex</td>
<td>Progressive senile dementia</td>
<td>Cortical atrophy, senile plaques (neuritics), neurofibrillary tangles, amyloid angiopathy</td>
</tr>
</tbody>
</table>

Correct Answer. d
(92). All of the following are the good prognostic features for Hodgkin’s disease except:

- a. Hemoglobin > 10g/dl
- b. WBC count < 15000/mm³
- c. Absolute lymphocyte count < 600/ul
- d. Age < 45 years

Solution. (c) Absolute lymphocyte count < 600/ul
Ref: Read the text below
Sol:

<table>
<thead>
<tr>
<th>Type</th>
<th>Incidence features</th>
<th>Pathological</th>
<th>Prognosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphocyte-depletion</td>
<td>2-15%</td>
<td>Scanty lymphocytes, atypical histiocytes, fibrosis</td>
<td>POOR</td>
</tr>
</tbody>
</table>

Correct Answer. c

(93). The most common histological type of thyroid cancer is :

- a. Medullary type
- b. Follicular type
- c. Papillary type
- d. Anaplastic type

Solution. (c) Papillary type
Ref: Read the text below
Sol:
- Papillary carcinoma of thyroid is the most common thyroid carcinoma, comprising 60-70% of cases.

Correct Answer. c

(94). Splenic macrophages in Gaucher’s disease differ from those in ceroid histiocytosis by staining positive for :

- a. Lipids
- b. Phospholipids
- c. Acid fast stain
- d. Iron

Solution. (d) Iron
Ref: Read the text below
Sol:
- Microscopy shows large number of characteristically distended and enlarged macrophages called Gaucher cells which are found in the spleen, liver, bone marrow and lymph nodes, and in the case of neuronal involvement, in the Virchow-Robin space.
- The cytoplasm of these cells is abundant, granular and fibrillar resembling crumpled tissue paper.
- They have mostly a single nucleus but occasionally may have two or three nuclei.
- Gaucher cells are positive with PAS, oil red 0, and Prussian-blue reaction indicating the nature of accumulated material as glycolipids admixed with haemosiderin.
- These cells often show erythrophago-cytosis and are rich in acid phosphatase

Correct Answer. d
(95). Which of the following is an autosomal dominant metabolic disorder?

a. Marfan syndrome  
b. Hereditary Nonpolyposis Colorectal Cancer  
c. Hereditary Multiple Exostoses  
d. Alpha-1 anti-trypsin deficiency

Solution. (d) Alpha-1 anti-trypsin deficiency  
Ref: Read the text below  
Sol:  
Autosomal dominant  
- Only one mutated copy of the gene will be necessary for a person to be affected by an autosomal dominant disorder. Each affected person usually has one affected parent.  
- The chance a child will inherit the mutated gene is 50%. Autosomal dominant conditions sometimes have reduced penetrance, which means although only one mutated copy is needed, not all individuals who inherit that mutation go on to develop the disease.  
- Examples of this type of disorder are Huntington's disease, neurofibromatosis type 1, neurofibromatosis type 2, Marfan syndrome, hereditary nonpolyposis colorectal cancer, and hereditary multiple exostoses, which is a highly penetrant autosomal dominant disorder. Birth defects are also called congenital anomalies.

Correct Answer. d

(96). The most common gene defect in idiopathic steroid resistant nephritic syndrome

a. ACE  
b. NPHS 2  
c. HOX 11  
d. PAX

Solution. (b) NPHS 2  
Ref: Read the text below  
Sol:  
- Genetic basis of proteinuria in nephrotic syndrome  
- Recently certain gene mutations have been recognized which are associated with certain glomerulonephritis, producing nephrotic syndrome.  
- The gene mutations code certain proteins and the common feature of these proteins is their localization to the structures of the glomerular filtration barrier; such as slit diaphragm and podocyte cytoskeletal structures such as actin.  
- Their specific functions and interaction are incompletely understood, but it is clear that the integrity of each is necessary to maintain the normal glomerular filtration barrier

<table>
<thead>
<tr>
<th>Gene</th>
<th>Chromosome</th>
<th>Protein</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPHS1</td>
<td>19q13</td>
<td>Nephrin</td>
<td>Nephrotic syndrome of Finnish type</td>
</tr>
<tr>
<td>NPHS2</td>
<td>1q25-31</td>
<td>Podocin</td>
<td>Steroid resistant nephrotic syndrome</td>
</tr>
</tbody>
</table>

Correct Answer. b
(97). Canals of hering are present in

a. Spleen
b. Liver
c. Lymph node
d. Bone marrow

**Solution.** (b) Liver
Ref.: Robbins - 835
Sol :
- It begins in bile canaliculi that form between two adjacent surfaces of hepatocytes, similar to terminal branches of a tree.
- The canaliculi join each other to form larger and larger structures, i.e. canals of hepatic duct.
- The ductules join to form bile ducts. That eventually form either right or left main hepatic duct.
- The right and left hepatic ducts join to form the common hepatic duct, which in turn joins the cystic duct to form.

**Correct Answer.** b

(98). Cytokines are secreted in sepsis and systemic inflammatory Response syndrome (SIRS) by

a. Neutrophils
b. Adrenal
c. Platelets
d. Collecting duct

**Solution.** (a) Neutrophils
Ref.: Read the text below
Sol :
- Cytokine release in Sepsis :
  o It is by TLR-4 and CD-14 mediated.
  o Signals from TLR-4 can directly activate vascular endothelium and leukocytes to release cytokine mediators.
- The major cells that secret cytokines in sepsis area :
  o Monocyte/Macrophages
  o Neutrophils
  o Endothelial cells
- Cytokine mediators involved are :
  o TNF - (The most important cytokine in sepsis)
  o 2. IL-1  3. IL-6  4. IL-8  5. No.

**Correct Answer.** a
(99). Memory T cells can be identified by using the following marker

a. CD45RA
b. CD45RB
c. CD45RC
d. CD45RO

Solution. (d) CD45RO
Ref.: Read the text below
Sol :

<table>
<thead>
<tr>
<th>Surface antigen</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD 45</td>
<td>All leukocytes (leukocyte common antigen)</td>
</tr>
<tr>
<td>CD 45 RA</td>
<td>Medullary T cells i.e., “naïve” T cells</td>
</tr>
<tr>
<td>CD 45 RB</td>
<td>All leukocytes</td>
</tr>
<tr>
<td>CD 45 RC</td>
<td>Subset T medullary thymocytes “naïve” T</td>
</tr>
<tr>
<td>CD 45 RO</td>
<td>Subset T, Cortical thymocytes “memory”</td>
</tr>
</tbody>
</table>

Correct Answer: d

(100). Kawasaki disease is associated with all except

a. Erythema
b. Posterior cervical lymphadenopathy
c. Thrombocytopenia
d. Conjuctivitis

Solution. (c) Thrombocytopenia
Ref.: Read the text below
Sol :
- Kawasaki disease, also known as lymph node syndrome, mucocutaneous lymph node syndrome and infant polyarteritis, is a poorly understood self - limited vasculitis that affects many organs, including the skin, mucus membrane, lymph nodes, heart and blood vessel walls.
- It is usually seen in children younger than 5 years.
- Kawasaki disease predominantly affect medium sized vessels, but may also affect small or large vessels.

Correct Answer: c
Reversible injury in myocardium occurs at

a. 2 minutes
b. 30 minutes
c. 2 hours
d. 5 hours

Solution. (b) 30 minutes

Ref.: Read the text below

Sol: Key events in ischemic cardiac myocytes

<table>
<thead>
<tr>
<th>Feature</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset of ATP depletion</td>
<td>Seconds</td>
</tr>
<tr>
<td>Loss of contractility</td>
<td>&lt; 2 minutes</td>
</tr>
<tr>
<td>ATP reduced to 50%</td>
<td>10 minutes</td>
</tr>
<tr>
<td>ATP reduced to 10%</td>
<td>40 minutes</td>
</tr>
<tr>
<td>Irreversible injury</td>
<td>20 – 40 min</td>
</tr>
<tr>
<td>Micro vascular injury</td>
<td>&gt; 1 hr.</td>
</tr>
</tbody>
</table>

Correct Answer. b

Coombs positive hemolytic anemia is associated with

a. TTP
b. PAN
c. SLE
d. HUS

Solution. (c) SLE

Ref.: Read the text below

Sol:
- Amongst the collagen vascular diseases, SLE is most frequently associated with Coomb's positive hemolytic anemia.
- PAN can also cause Coomb's positive hemolytic anemia, but it is very rare.

Correct Answer. c

A 33-year-old man comes to see you because of several episodes of hemoptysis and dyspnea during the last 2 weeks. Physical examination reveals hypertension and edema. You order some laboratory tests and the results indicate an iron-deficiency anemia, hematuria, and proteinuria with RBC casts. At this point you strongly suspect that he has which of the following diseases?

a. Fibrosing alveolitis
b. Goodpasture syndrome
c. Kartagener syndrome
d. Systemic lupus erythematosus

Solution. (b) Goodpasture syndrome

Ref: Read the text below

Sol:
- Goodpasture syndrome consists of antibodies against basement membrane material, recurrent pulmonary hemorrhage, and glomerulonephritis.
- The pathologic changes are due to a type II hypersensitivity reaction along the basement membranes of the lung and kidney.
- Steroids, plasmapheresis, and immunosuppressive medicines may help in a minority of cases.
- Fibrosing alveolitis is a pulmonary disorder of unknown etiology. Glomerulonephritis and pulmonary hemorrhage are not observed clinically.
- Kartagener syndrome is a hereditary disease of infancy due to a defect in respiratory ciliary action. Systemic lupus erythematosus may present with renal insufficiency. Antibodies are directed against nuclear antigens.

Correct Answer. b
(104). The stain used for demonstrating Auer rods in blasts is

a. Periodic Acid Schiff (PAS)

b. Myeloperoxidase

c. Leucocyte alkaline phosphatase

d. Non-specific esterase

**Solution.** (b) Myeloperoxidase

Ref.: Robbin’s - 623

Sol:
- Auer rods are linear or spindle shaped, red purple inclusions in myeloblasts or promyelocytes.
- Less commonly they may be seen in more mature neutrophils.
- Auer rods are derivatives of Azurophilic granules and stain positively for Myeloperoxidase, Sudan Black B (SSB), and ASD – chloracetate esterase (CAE).

**Correct Answer.** b

(105). “Working formulation” in staging of NHL is based on-

a. Survival characteristics of cells

b. Morphology of cells

c. Cells of origin

d. None of the above.

**Solution.** (b) Morphology of cells

Ref.: Taylor’s - 454

Sol:
- Grading of NHL by working formulation is based on the morphology of the cells (small or large, cleaved or uncleaved) and on growth pattern (follicular or diffuse.)

**Correct Answer.** b
Acute lung injury is caused by-

a. Aspiration
b. Toxic gas inhalation
c. Cardiopulmonary bypass with heart lung machine
d. All of the following

Solution. (d) All of the following
Ref.: Read the text below
Sol:
- ARDS is an acute diffuse alveolar injury that is caused by variety of aetiological actors.
- Patients with ARDS are often seriously ill with some other disease and features of ARDS are superimposed on them.
- Causes of ARDS

<table>
<thead>
<tr>
<th>Direct lung injury</th>
<th>Indirect lung injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia</td>
<td>Sepsis</td>
</tr>
<tr>
<td>Aspiration of gastric contents</td>
<td>Severe trauma</td>
</tr>
<tr>
<td>Inhalational injury (Toxic gases)</td>
<td>Acute pancreatitis</td>
</tr>
<tr>
<td>Near drowning</td>
<td>Cardiopulmonary bypass</td>
</tr>
<tr>
<td>Pulmonary contusion</td>
<td>Massive transfusions</td>
</tr>
<tr>
<td>Fat embolism</td>
<td>Drug overdose</td>
</tr>
<tr>
<td>Reperfusion pulmonary edema</td>
<td></td>
</tr>
<tr>
<td>Post lung transplantation or</td>
<td></td>
</tr>
<tr>
<td>Pulmonary embolectomy</td>
<td></td>
</tr>
</tbody>
</table>

Correct Answer. d

Bronchiectasis is most common in which lobe -

a. Right upper lobe
b. Right middle lobe
c. Left upper lobe
d. Left lower lobe

Solution. (d) Left lower lobe
Ref.: Robin’s - 693
Sol:
Bronchiectasis commonly affects lower lobe bronchi, the left side being involved more frequently than right.
- The airways are dilated, sometimes up to four times normal size.
- Dilatation may be of following type -
  - Cylindrical bronchiectasis - The most common type characterized by tube like bronchial dilatation.
  - Fusiform – Spindle – shaped bronchial dilatation.
  - Saccular – Rounded sac-like bronchial dilatation.
  - Varicose – Appears beaded, because areas of diatation are mixed with areas of constriction.
- Pathogenesis of bronchiectasis The major factors in the pathogenesis of bronchiectasis are -
  - Obstruction
  - Infection
  - Both are necessary for the development of full fledged lesions, although either may come first.
  - Bronchial obstruction impairs normal clearing mechanism and results in pooling of mucus.
  - This predisposes to infection and infection of the bronchi lead to inflammation, often with necrosis, fibrosis, and eventually dilatation of airways.

Correct Answer. d
(108). The following change in esophagus is characterised by which genetic mutation in the early stages

- a. EGFR
- b. Cyclin D1
- c. CDKN2A
- d. KRAS

**Solution.** (c) CDKN2A

Ref. Read the text below

Sol:

Molecular studies suggest that the progression of Barrett esophagus to adenocarcinoma occurs over an extended period through the stepwise acquisition of genetic and epigenetic changes. This model is supported by the observation that epithelial clones identified in nondysplastic Barrett metaplasia persist and accumulate mutations during progression to dysplasia and invasive carcinoma. Chromosomal abnormalities, mutation of TP53, and downregulation of the cyclin-dependent kinase inhibitor CDKN2A, also known as p16/INK4a, are detected at early stages. In the case of CDKN2A, both allelic loss and hypermethylation-induced epigenetic silencing have been described. Later during progression there is amplification of EGFR, ERBB2, MET, cyclin D1, and cyclin E genes.

**Correct Answer.** c

(109). All of the following statements regarding amyloidosis are true except

- a. Multiple myeloma – shows AL type deposits
- b. Secondary amyloidosis – shows AA type deposits
- c. Renal amyloidosis commonly presents with hypertension
- d. Renal amyloidosis commonly presents with mild proteinuria

**Solution.** (c) Renal amyloidosis commonly presents with hypertension

Ref.: Robbin’s - 252

Sol:

- Most common presentation is proteinuria.
- Hypertension may occur but it is not common, it occurs in 20-50% of the patients

**Correct Answer.** c
Amyloid deposits stain positively with all the following except

a. Congo-red
b. Crystal violet
c. Methenamine silver
d. Thioflavin T

**Solution.** (c) Methenamine silver  
Ref.: Robbin’s - 89  
Sol: Staining Characteristics of Amyloid

| Stain on Gross | Stain used – Lugol’s iodine  
|Appearance: Imparts purple colour, on addition of dilute sulfuric acid turns blue. |
| Hematoxylin & Eosin | Stain used – Hematoxylin & Eosin  
|Appearance – On light microscopy appear as extracellular homogeneous structure less eosinophilic hyaline material |

| Metachromatic stains (Rosamine dyes) | Stains used – Methyl violet and crystal violet  
|Appearance – Rose pink coloration of amyloid deposits |
| Congo red and polarized light (All types of amyloid have affinity for congo red stain) | Stain used – Congo red  
|Appearance – Ordinary light – Pink  
Polarised – Apple green birefringence light |
| Fluorescent stains | Stain used – Thioflavin – T  
|Appearance – yellow under ultraviolet light |
| Immunohistochemistry | Stain used – Various antibody stains against the specific antigenic protein types e.g. Anti AP, anti AA, anti Lambda, anti kappa |
| Non specific stains | Stain used: Toluidine blue  
|Alcian blue  
|Periodic acid Schiff  
|Colour imparted: Orthochromatic blue  
|Blue green colour |

Correct Answer: c
(111). Single gene disorder is -

a. Glycogen storage disease
b. DM
c. HT
d. All of above.

**Solution.** (a) Glycogen storage disease
Ref.: Robbin's - 140
Sol:
Genetic disorder may be of following categories.
- Mendelian disorders (single gene disorders)
  - All mendelian disorders are the result of expressed mutations in single genes of large effect.
  - Mendelian disorders may be -
    - Autosomal dominant, e.g. Retinoblastoma.
    - Autosomal recessive, e.g. Glycogen storage disease.
    - X-linked, e.g. Hemophilia A & B
Diseases with multifactorial inheritance
- These diseases are influenced by both genetic and environmental factors.
- Examples diabetes and hypertension.
- Chromosomal disorders
- Result from genomic or chromosomal mutations and are therefore associated with numerical or structural changes in chromosome.

**Correct Answer.** a

(112). The chances of having an unaffected baby, when both parents have achondroplasia are

a. 0%
b. 25%
c. 50%
d. None

**Solution.** (b) 25%
Ref.: Robbin's - 141
Sol:
Achondroplasia is autosomal disease.
- If both the parents are affected than the change of having unaffected baby is 25%.

```
  Aa      Aa
 ↓       ↓
AA      Aa      Aa      aa
```

**Correct Answer.** b
(113). Palindromic DNA implies

a. Short stretches of DNA

b. Recognised by specific restriction endonuclease

c. Complementary strands

d. All of above

Solution. (d) All of above.
Ref.: Robbin's - 415
Sol:
Palindromic DNA
- A DNA sequence consists of two complementary short stands coiled in a double helical structure.
- A sequence of duplex DNA that is same when two strands are read in opposite direction is called palindrome.

5' - GCCG - 3'
3' - CCGG - 5'

Figure 1 - Palindrome
- These palindrome serves as the target for most restriction endonuclease.

Correct Answer. d

(114). Atheroma resulting in angina has following characteristic except

a. Thin fibrous cap

b. Thick fibrous cap

c. Lack of macrophage

d. Lack of smooth muscle cell

Solution. (d) Lack of smooth muscle cell
Ref.: Robbin's - 505
Sol:
Atherosclerotic plaque is composed of three major components.
- Cellular component - Predominantly smooth muscle cells and macrophages. Others are lymphocytes.
- Connective tissue matrix (ECM) - Collagen, elastic fibers, proteoglycans.
- Both intracellular and extracellular. The major lipid is cholesterol and cholesterol esters.

Correct Answer. d

(115). Hyaline arteriolosclerosis is characteristic of

a. Buerger's disease

b. Benign hypertension

c. Syphilis

d. Malignant hypertension

Solution. (b) Benign hypertension
Ref.: Robbin's - 495
Sol:
- Hyaline arteriolosclerosis, also arterial hyalinosis and arteriolar hyalinosis, refers to thickening of the walls of arterioles by the deposition of homogeneous pink hyalinematerial. It is a type of arteriolosclerosis, which refers to hardening of the arteriolar wall.
- It is associated with aging, hypertension, diabetes mellitus and may be seen in response to certain drugs (calcineurin inhibitors).
- It is often seen in the context of kidney pathology. In hypertension only the afferent arteriole is affected, while in diabetes mellitus, both the afferent and efferent arteriole are affected.

Correct Answer. b
(116). Choledochal cyst develops due to?

a. Stenosis of sphincter

b. Dysfunction of Long/Circular fibres

c. Congenital

d. Iatrogenic

**Solution.** (c) Congenital
Ref: Read the text below

Sol:
- The term choledochal cyst refers to a spectrum of congenital biliary tract disorders that were previously grouped under the name idiopathic dilatation of the common bile duct. Based on the classification system proposed by Alonso-Lej, five types of choledochal cyst are described.
- Type I choledochal cysts are characterized by fusiform dilatation of the bile duct. This type is the most common and found in 80 to 90% cases.
- Type II choledochal cysts appear as an isolated diverticulum protruding from the wall of the common bile duct. The cyst may be joined to the common bile duct by a narrow stalk.
- Type III choledochal cysts arise from the intraduodenal portion of the common bile duct and are also known as choledochoceles.
- Type IVA choledochal cysts consist of multiple dilatations of the intrahepatic and extrahepatic bile ducts.
- Type IVB choledochal cysts are multiple dilatations involving only the extrahepatic bile ducts.
- Type V cysts (Caroli’s disease) consist of multiple dilatations limited to the intrahepatic bile ducts.

**Correct Answer.** c

(117). Catgut is made from intestine of?

a. Cat

b. Human

c. Sheep

d. All of the above

**Solution.** (c) Sheep
Ref: Read the text below

Sol:
- Catgut is made up of collagen derived from healthy sheep or cattle

**Correct Answer.** c

(118). The probable cause of sudden death in a case of superficial injury to neck is?

a. Injury to phrenic nerve

b. Air embolism through external jugular vein

c. Bleeding from subclavian artery

d. Injury to trachea

**Solution.** (b) Air embolism through external jugular vein
Ref: Read the text below

Sol:
- Penetrating neck trauma is any injury that penetrates through the platysma.
- Vascular injuries most immediately life-threatening, missed esophageal injury causes late mortality.
- When the neck or chest veins are injured, air may enter the veins and causes immediate death due to air embolism

**Correct Answer.** b
(119). Commonest complication of diverticulosis of sigmoid colon is?

a. Perforation

b. Intussusception

c. Haemorrhage

d. Diverticulosis

Solution. (c) Haemorrhage
Ref: Read the text below
Sol:
- Diverticulosis refers to the presence of diverticula without inflammation.
- Diverticulitis refers to inflammation and infection associated with diverticula.
- Although diverticulosis is common, most cases are asymptomatic and complications occur in the minority of people with this condition.
- Most common complications are bleeding, intussusception and obstruction
- Least common complication is diverticulitis
- Colovesical fistula is the most common type of fistula encountered in diverticular disease
- Abscess formation is the most common complication of acute diverticulitis, occurring in 32-68% of complicated diverticular cases.

Correct Answer. c

(120). Which of these is true regarding Libman sach’s lesion

a. Causes perforation of valves

b. Involves multiple valves

c. Consists of large vegetation

d. Vegetations on the surface of valve spreads to mural endocardium

Solution. (d) Vegetations on the surface of valve spreads to mural endocardium
Ref.: Robbin’s - 569
Sol:
- SLE endocarditis is also known as libman Sacks endocarditis, vegetations occur on both atrial and ventricular surface of the valve.
- It can also extend to chordate tendinae and mural endocardium.

Correct Answer. d

(121). A 68-year old man has had progressive dyspnea for the past year. On physical examination, extensive rales are heard in all lung fields. An echocardiogram shows that the left ventricular wall is markedly hypertrophied. A chest radiograph shows pulmonary edema and a prominent left-sided heart shadow. Which of the following conditions has most likely produced these findings?

a. Centrilobular emphysema

b. Systemic hypertension

c. Tricuspid valve regurgitation

d. Chronic alcoholism

Solution. (b) Systemic hypertension
Ref: Read the text below
Sol:
- Hypertension is an important cause to left ventricular hypertrophy and failure.
- Left-sided heart failure leads to pulmonary edema with dyspnea.

Correct Answer. b
(122). A 70-year-old man takes large quantities of nonsteroidal anti-inflammatory drugs (NSAIDs) because of chronic degenerative arthritis of the hips and knees. Recently, he has had epigastric pain with nausea and vomiting and has an episode of hematemesis. On physical examination, there are no remarkable findings. A gastric biopsy specimen is most likely to show which of the following lesions?

a. Epithelial dysplasia
b. Hyperplastic polyp
c. Acute gastritis
d. Adenocarcinoma

**Solution.** (c) Acute gastritis
Ref: Read the text below
**Sol:**
- Prolonged use of nonsteroidal anti-inflammatory drugs is an important cause of acute gastritis.

**Correct Answer.** c

(123). A 57 years old woman has had burning epigastric pain after meals for more than 1 year. Physical examination shows no abnormal findings. Upper gastrointestinal endoscopy shows an erythematous patch in the lower esophageal mucosa. A biopsy specimen shows basal squamous epithelial hyperplasia, elongation of lamina propria papillae, and scattered epithelial neutrophils with some eosinophils. Which of the following is the most likely diagnosis?

a. Barret esophagus
b. Esophageal varices
c. Reflux esophagitis
d. Scleroderma

**Solution.** (c) Reflux esophagitis
Ref: Read the text below
**Sol:**
- These findings indicate an ongoing inflammatory process resulting from reflux of acid gastric contents into the lower esophagus.

**Correct Answer.** c

(124). A 41-year-old man has HIV positive for the past 8 years and has been receiving highly active antiretroviral therapy (HAART) for the past year. For the past 2 weeks, he has experienced pain when swallowing. He has had no episodes of hematemesis and no nausea or vomiting. There are no remarkable findings on physical examination. The CD4+ lymphocyte count is now 285/ul. Which of the following conditions is most likely to produce these findings?

a. Esophageal squamous cell carcinoma
b. Achalasia
c. Lower esophageal fibrosis with stenosis
d. Herpes simplex esophatitis

**Solution.** (d) Herpes simplex esophatitis
Ref: Read the text below
**Sol:**
- A Patient who is infected with HIV and has low CD4+ cell counts is at great risk of developing infections.
- Herpes simplex and Candida are the most likely upper gastrointestinal infections involving the esophagus.
- Squamous cell carcinoma of the esophagus is not related to HIV infection.

**Correct Answer.** d
(125). All are true about type III hypersensitivity except

a. Serum sickness

b. Arthus reaction

c. Anaphylaxis

d. Lupus nephritis

Solution. (c) Anaphylaxis
Ref: Read the text below
Sol:
- Anaphylaxis is a type I hypersensitivity reaction. Immediate, or type I, hypersensitivity is a rapid immunologic reaction occurring within minutes after the combination of an antigen with antibody bound to mast cells in individuals previously sensitized to the antigen.
- These reactions are often called allergy, and the antigens that elicit them are allergens. Immediate hypersensitivity may occur as a systemic disorder as a local reaction.

Correct Answer. c

(126). Perl's stain is used to demonstrate

a. Melanin

b. Hemosiderin

c. Bilirubin

d. Lipofuscin

Solution. (b) Hemosiderin
Ref: Read the text below
Sol:
- Perl's stain (Prussian blue stain) is used for demonstration of hemosiderin in tissues

Correct Answer. b
The expression of the following oncogene is associated with a high incidence of Medullary carcinoma of thyroid:

- P53
- HER-2 / neu
- RET proto Oncogene
- RB gene

**Solution.** (c) RET proto Oncogene

Ref: Read the text below

Sol:

RET protooncogene is a growth factor receptor (receptor tyrosine kinase). The RET protein is a receptor for the glial cell lined derived neurotrophic factor and structurally related proteins that promote cell survival during neural development. RET is normally expressed in the following cells.

- Parafollicular C cells of the thyroid
- Adrenal medulla involved in the mutation of
- Parathyroid cell precursors.

<table>
<thead>
<tr>
<th>Protooncogenes</th>
<th>Mode of activation</th>
<th>Associated human tumours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERB-B1</td>
<td>Over expression</td>
<td>Squamous cell Ca of lung</td>
</tr>
<tr>
<td>ERB-B2</td>
<td>Amplification</td>
<td>Breast and ovarian Ca.</td>
</tr>
<tr>
<td>C-MYC</td>
<td>Translocation</td>
<td>Burkitt lymphoma</td>
</tr>
<tr>
<td>N-MYC</td>
<td>Amplification</td>
<td>Neuroblastomas</td>
</tr>
<tr>
<td>L-MYC</td>
<td>Amplification</td>
<td>Small cell Ca of lung</td>
</tr>
<tr>
<td>K-RAS</td>
<td>Point mutation</td>
<td>Colon, lung Pancreas</td>
</tr>
<tr>
<td>H-RAS</td>
<td>Point mutation</td>
<td>Bladder &amp; Kidney</td>
</tr>
<tr>
<td>N-RAS</td>
<td>Point mutation</td>
<td>Melanomas, hematological Malignancy</td>
</tr>
</tbody>
</table>

**Correct Answer.** c

The Finnish type of congenital nephritic syndrome occurs due to gene mutations affecting the following protein:

- Podocin
- Alpha-actinin
- Nephrin
- CD2 activated protein

**Solution.** (c) Nephrin

Ref: Read the text below

Sol:

“A mutation in the Nephrin gene causes a hereditary form of congenital Nephrotic syndrome (Finnish type) with minimal change glomerular morphology”. Nephrin

- Nephrin is a key component of the slit diaphragm
- It is a zipper-like structure between podocyte food process that might control glomerular permeability
- The Nephrin gene maps to chromosome 19q13 and is termed as NPHS1.
- Several type of Mutations of the NPHS1 gene have been identified and they give rise to congenital nephritic syndrome of the Finnish type.

Note:

- ‘Podocin’ has also been recognized as a component of the slit diaphragm
- Podocin is encoded by a gene termed as NPHS 2 and maps to chromosome 1q25-31
- Mutation in the podocin gene or NPHS2 lead to an autosomal recessive form of focal segmental glomerulosclerosis.

**Correct Answer.** c
(129). Dot like positivity for epithelial membrane antigen is seen in

a. Meningioma
b. Metastatic carcinoma
c. Ependymoma
d. Medulloblastoma

**Solution.** (c) Ependymoma
Ref: Read the text below
Sol :
Ependymomas are tumors showing glial and epithelial differentiation, characterised by GFAP and EMA positivity respectively. IHC markers positive are
- GFAP, S100, vimentin
- EMA (positive along luminal surface of ependymal rosettes or as dotlike cytoplasmic vacuoles representing microlumens)
- Rarely cytokeratin

**Correct Answer.** c

(130). A 38 year old woman has a mobile lump in her breast. A FNAC was performed. The cytology picture is shown below. Which of the following features on cytology do not favour a benign diagnosis?

a. Bare bipolar nuclei
b. Cohesive clusters of epithelial cells
c. Absence of myoepithelial cells
d. Stromal fragments

**Solution.** (c) Absence of myoepithelial cells
Ref: Read the text below
Sol :
- Absence of myoepithelial cells is a harbinger of malignancy.

**Correct Answer.** c
(131). Which of the following is not directly related with Buerger’s disease?

a. Claudication  
b. Thromboangitis obliterans  
c. Night sweats  
d. Poor tolerance of cold

Solution. (c) Night sweats

Ref: Read the text below

Sol:
- Buerger’s disease (also known as thromboangiitis obliterans) is a recurring inflammation and thrombosis (clotting) of small and medium arteries and veins of the hands and feet. It is strongly associated with use of tobacco products, primarily from smoking, but also from smokeless tobacco.
- A concrete diagnosis of thromboangiitis obliterans is often difficult as it relies heavily on exclusion of other conditions. The commonly followed diagnostic criteria are outlined below although the criteria tend to differ slightly from author to author. Olin proposes the following criteria:
  1. Typically between 20–40 years old and male, although recently females have been diagnosed.
  2. Current (or recent) history of tobacco use
  3. Presence of distal extremity ischemia (indicated by claudication, pain at rest, ischemic ulcers or gangrene) documented by noninvasive vascular testing such as ultrasound
  4. Exclusion of other autoimmune diseases, hypercoagulable states, and diabetes mellitus by laboratory tests.
  5. Exclusion of a proximal source of emboli by echocardiography and arteriography
  6. Consistent arteriographic findings in the clinically involved and noninvolved limbs.

Correct Answer. (c)

(132). Which of the following is not directly related with Kawasaki disease?

a. Lymphadenitis  
b. Fever  
c. Arthritis  
d. Conjunctiva

Solution. (c) Arthritis

Ref: Read the text below

Sol:
Kawasaki disease (also known as lymph node syndrome, Mucocutaneous lymph node syndrome and Kawasaki syndrome) is an autoimmune disease that manifests as a multisystemic necrotizing medium vessel vasculitis that is largely seen in children under 5 years of age, which affects many organs, including the skin, mucous membranes, lymph nodes, and blood vessel walls, but the most serious effect is on the heart where it can cause severe aneurysmal dilations in untreated children.
- High-grade fever (greater than 39 °C or 102 °F; often as high as 40 °C or 104 °F) that normally lasts for more than 5 days if left untreated.
- Red eyes (conjunctivitis) without pus or drainage, also known as "conjunctival injection"
- Bright red, chapped, or cracked lips
- Red mucous membranes in the mouth
- Strawberry tongue, white coating on the tongue or prominent red bumps (papillae) on the back of the tongue
- Red palms of the hands and the soles of the feet
- Rash which may take many forms, but not vesicular (blister-like), on the trunk
- Swollen lymph nodes (frequently only one lymph node is swollen), particularly in the neck area
- Joint pain (arthralgia) and swelling, frequently symmetrical
- Irritability
- Tachycardia (rapid heart beat)
- Peeling (desquamation) palms and soles (later in the illness); peeling may begin around the nails
- Beau’s lines (transverse grooves on nails)
- may find breathing difficult.

Correct Answer. (c)
(133). Which of the following is not directly related with Pericarditis?

a. Conjunctiva
b. SLE
c. Uremia
d. Rheumatic fever

Solution. (a) Conjunctiva
Ref: Read the text below
Sol: Infectious
Pericarditis may be caused by viral, bacterial, or fungal infection. The most common viral pathogen has traditionally been considered coxsackievirus. Pneumococcus or tuberculous pericarditis are the most common bacterial forms. Fungal pericarditis is usually due to histoplasmosis, or in immunocompromised hosts Aspergillus, Candida, and Coccidioides.

Other
- Idiopathic: No identifiable etiology found after routine testing.
- Immunologic conditions including lupus erythematosus (more common among women) or rheumatic fever
- Myocardial Infarction (Dressler's syndrome)
- Trauma to the heart, e.g. puncture, resulting in infection or inflammation
- Uremia (uremic pericarditis)
- Malignancy (as a paraneoplastic phenomenon)

- Side effect of some medications, e.g. isoniazid, cyclosporine, hydralazine
- Radiation induced
- Aortic dissection
- Tetracyclines
- Postpericardiotomy syndrome

Correct Answer. a

(134). Which of the following is not directly related with pheochromocytoma?

a. Pallor
b. Perspiration
c. Decreased blood pressure
d. Headaches

Solution. (c) Decreased blood pressure
Ref: Read the text below
Sol: The signs and symptoms of a pheochromocytoma are those of sympathetic nervous system hyperactivity, including:
- Skin Sensations
- Flank Pain
- Elevated heart rate
- Elevated blood pressure, including paroxysmal (sporadic, episodic) high blood pressure, which sometimes can be more difficult to detect; another clue to the presence of pheochromocytoma is orthostatic hypotension (a fall in systolic blood pressure greater than 20 mmHg or a fall in diastolic blood pressure greater than 10 mmHg on making the patient stand)
- Palpitations
- Anxiety often resembling that of a panic attack
- Diaphoresis
- Headaches
- Pallor
- Weight loss
- Localized amyloid deposits found microscopically
- Elevated blood glucose level (due primarily to catecholamine stimulation of lipolysis (breakdown of stored fat) leading to high levels of free fatty acids and the subsequent inhibition of glucose uptake by muscle cells. Further, stimulation of beta-adrenergic receptors leads to glycogenolysis and gluconeogenesis and thus elevation of blood glucose levels).

Correct Answer. c
(135). An electron microscopic (EM) picture taken of the irreversibly injured myocardium reveals the presence of large, dark, irregular amorphic densities within mitochondria, which are referred to as?

a. Apoptotic bodies
b. Flocculent densities
c. Myelin figures
d. Psammoma bodies

Solution. (b) Flocculent densities Sol
- With prolonged ischemia, certain cellular events occur that are not reversible, even with restoration of oxygen supply.
- These cellular changes are referred to as irreversible cellular injury.
- This type of injury is characterized by severe damage to mitochondria (vacuole formation), extensive damage to plasma membranes and nuclei, and rupture of lysosomes.
- Severe damage to mitochondria is characterized by the influx of calcium ions into the mitochondria and the subsequent formation of large, flocculent densities within the mitochondria.
- These flocculent densities are characteristically seen in irreversibly injured myocardial cells that undergo reperfusion soon after injury.

Correct Answer. b

(136). The normal tensile strength of tissue at the site of wound is gained after

a. One week of wound healing
b. Two weeks of wound healing
c. Three months of wound healing
d. Two year of wound helaing

Solution. (c) Three months of wound healing
Ref.: Robbin’s - 106
Sol :
- 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 second months, the strength reaches a plateau of about 70 to 80% of the normal skin, a condition that may persist for life.
  - Tensile strength never reaches the normal strength of unwounded tissue (i.e. 100%).
  - Maximum strength is achieved by the end of 3 months.

Correct Answer. c

(137). When leukocytes are arranged along the endothelium of blood vessels it is called

a. Diapedesis
b. Adhesion
c. Margination
d. Chemotaxis

Solution. (c) Margination
Ref.:Read the text below
Sol :
Margination is the process in which free-flowing leukocytes exit the central blood stream, and initiate leukocyte and endothelial cell interactions by close mechanical contact. The underlying mechanisms of margination involve the interaction of leukocytes with erythrocytes flowing in the same microvessel, whereby deformed erythrocytes push leukocytes to a marginating position due to their smaller cross section and higher flow velocity.

Correct Answer. c
(138). Which leukotriene is the adhesion factor for the neutrophil on the cell surface to attach to endothelium

a. B4
b. C4
c. D4
d. E4

**Solution.** (a) B4

Ref.: Read the text below

Sol:
Leukotriene B4 is a leukotriene involved in inflammation. It is produced from leukocytes in response to inflammatory mediators and is able to induce the adhesion and activation of leukocytes on the endothelium, allowing them to bind to and cross it into the tissue.[1] In neutrophils, it is also a potent chemotactic attractant, and is able to induce the formation of reactive oxygen species and the release of lysosome enzymes by these cells.[1] It is synthesized by leukotriene-A4 hydrolase from leukotriene A4.

**Correct Answer.** a

(139). Antigen presenting cells are all of the following except

a. Astrocytes
b. Endothelial cells
c. Epithelial cells
d. Langerhans cells

**Solution.** (a) Astrocytes

Ref.: Read the text below

Sol:
An antigen-presenting cell (APC) or accessory cell is a cell that displays foreign antigens complexed with major histocompatibility complexes (MHCs) on their surfaces; this process is known as antigen presentation. APCs fall into two categories: professional and non-professional. Professional APCs: There are three main types of professional antigen-presenting cells:
- **Dendritic cells** (DCs), which have the broadest range of antigen presentation, and are probably the most important APC. Activated DCs are especially potent TH cell activators because, as part of their composition, they express co-stimulatory molecules such as B7. This B7 co-stimulator of mature interdigitating dendritic cell (IDC) interacts with surface CD28 of naïve T-cell.
- **Macrophages**.
- **Certain B-cells**, which express (as B cell receptor) and secrete a specific antibody, can internalize the antigen, which bind to its BCR and present it incorporated to MHC II molecule, but are inefficient APC for most other antigens.
- **Certain activated epithelial cells**

Non-professional
A non-professional APC does not constitutively express the Major Histocompatibility Complex class II (MHC class II) proteins required for interaction with naive T cells; these are expressed only upon stimulation of the non-professional APC by certain cytokines such as IFN-γ.

Non-professional APCs include:
- **Fibroblasts** (skin)
- **Thymic epithelial cells**
- **Thyroid epithelial cells**
- **Glia cells** (brain)
- **Pancreatic beta cells**
- **Vascular endothelial cells**

**Correct Answer.** a
(140). Commonest site of lytic lesion in multiple myeloma is-

a. Vertebral column
b. Femur
c. Clavicle
d. Pelvis

Solution. (a) Vertebral column
Ref.: Harrison - 659
Sol : Bone lesions are most common in vertebral column.

- The following distribution was seen in large series of case :
  - Vertebral column → 66%
  - Pelvis → 28%
  - Ribs → 44%
  - Skull → 4%
  - Femur → 28%
  - Clavicle → 10%

Correct Answer. a

(141). Bone marrow biopsy is useful in the diagnosis of

a. CML
b. ALL
c. Aleukemic leukemia
d. Hodgkins disease

Solution. (c) Aleukemic leukemia
Ref.: P.J. Mehta - 366
Sol : Bone-marrow examination essential for the diagnosis.
- Aplastic anemia
- Aleukemic leukemia
- Myelosclerosis
- Megaloblastic anemia
- Myelofibrosis
- Multiple myeloma
Bone-marrow examination helpful but not essential for the diagnosis -
- Anemias :
  - Refractory anemia
  - Iron deficiency anemia
  - Hemolytic anemias
- Leukemias – to differentiate the types of leukemias
  - Thrombocytopenic purpura
  - Agranulocytosis
  - Hypersplenism
- Tropical diseases like malaria, kala azar
- Malignancy – secondary carcinoma
- Infiltrative disorders eg. Gaucher’s disease

Correct Answer. c
(142). In which of the following conditions that cause polycythemia is the serum erythropoietin extremely low –

a. Dehydration
b. Renal cell carcinoma
c. Renal carcinoma
d. Polycythemia vera

Solution. (d) Polycythemia vera
Ref.:Robbin’s - 629
Sol:
- Polycythemia vera progenitor cells have markedly decreased requirements for erythropoietin and other hematopoietic growth factors.
- Accordingly, Serum erythropoietin levels in polycythemia vera are very low, whereas almost all other forms of absolute polycythemia are caused by elevated erythropoietin levels.

Correct Answer. d

(143). In diffuse calcification of pancreas calcium lies in

a. Acinar tissues
b. Interstitium
c. Pancreatic ducts
d. Any where

Solution. (d) Any where
Ref.:Robbins - 945
Sol: Pancreatic calcifications can arise form many aetiologies
Punctate intraductal calcifications
- acute alcoholic pancreatitis (20-40%):
  o intraductal, numerous, small, irregular
  o preponderant cause of diffuse pancreatic intraductal calcification
- idiopathic : no underlying cause can be determined
- hyperparathyroidism (10%) : look for nephrocalcinosis or urolithiasis (70%)
  Kwashiorkor :
  o calcifications are common. Seen in pediatric population
Smaller intraductal calculations
- senile : over 70 y/o. Scattered. Calcifications increase with age
- cystic fibrosis: finely granular calcifications in smallest ducts in end stage disease with pancreatic failure
- atherosclerotic calcifications
Larger intraductal calcifications
- hereditary pancreatitis :
  o autosomal dominant 9% penetrance
  o large rounded shape
  o peaks at 5-17 yrs
- gallstone migration
- tropical pancreatitis : young persons in tropical countries
Dystrophic calcification

Correct Answer. d
(144). Birbeck granules in the cytoplasm are seen in

a. Mast cells  
b. Langerhan’s cells  
c. Thrombocytes  
d. Myelocytes  

**Solution.** (b) Langerhan’s cells  
Ref.: Robbins - 631  
Sol: 
Birbeck granules, also known as Birbeck bodies, are rod shaped or “tennis-racket” cytoplasmic organelles with a central linear density and a striated appearance. They are a characteristic microscopic finding in Langerhans cell histiocytosis (Histiocytosis X), which is one of a group of rare conditions collectively known as histiocytosis. Formation is induced by langerin.  

**Correct Answer.** b  

(145). Pale infarcts are seen at all of the following sites except

a. Heart  
b. Spleen  
c. Kidney  
d. Lung  

**Solution.** (d) Lung  
Ref.: Robbins - 128  
Sol:  

<table>
<thead>
<tr>
<th>Red infarcts (Haemorrhagic)</th>
<th>Occur with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Venous occlusions (e.g. ovarian torsion):</td>
</tr>
<tr>
<td></td>
<td>2. In loose tissues (such as lungs):</td>
</tr>
<tr>
<td></td>
<td>3. In tissues with dual circulation (e.g. Lung &amp; S. intestine):</td>
</tr>
<tr>
<td></td>
<td>4. In tissues that were previously congested because of sluggish venous out flow:</td>
</tr>
<tr>
<td></td>
<td>5. When flow is re established to a site of previous arterial occlusion and necrosis:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>White infarcts: occur with:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Arterial occlusions, or</td>
</tr>
<tr>
<td></td>
<td>2. In solid organs e.g. Heart, spleen, kidney and brain where the solidity of tissue limits the amount of hemorrhage that can seep into the area of ischemic necrosis:</td>
</tr>
</tbody>
</table>

**Correct Answer.** d
(146). Mutations of which of the following have also been implicated in melanoma

a. CD33
b. CD38
c. CD117
d. CD137

Solution. (c) CD117
Ref: Read the text below
Sol:
CD117 is a proto-oncogene, meaning that overexpression or mutations of this protein can lead to cancer. Seminomas, a subtype of testicular germ cell tumors, frequently have activating mutations in exon 17 of CD117. In addition, the gene encoding CD117 is frequently overexpressed and amplified in this tumor type, most commonly occurring as a single gene amplicon. Mutations of CD117 have also been implicated in leukemia, a cancer of hematopoietic progenitors, melanoma, mast cell disease, and gastrointestinal stromal tumors (GISTs). The efficacy of imatinib (trade name Gleevec), a CD117 inhibitor, is determined by the mutation status of CD117. When the mutation has occurred in exon 11 (as is the case many times in GISTs), the tumors are responsive to imatinib. However, if the mutation occurs in exon 17 (as is often the case in seminomas and leukemia), the receptor is not inhibited by imatinib. In those cases other inhibitors such as dasatinib and nilotinib can be used.

Diagnostic relevance
Antibodies to CD117 are widely used in immunohistochemistry to help distinguish particular types of tumor in histological tissue sections. It is used primarily in the diagnosis of GISTs, which are positive for CD117, but negative for markers such as desmin and S-100, which are positive in smooth muscle and neural tumors, which have a similar appearance. In GISTs, CD117 staining is typically cytoplasmic, with stronger accentuation along the cell membranes. CD117 antibodies can also be used in the diagnosis of mast cell tumours and in distinguishing seminomas from embryonal carcinomas

Correct Answer. c

(147). Two of five children in a family are affected by a disorder that results in the development of multiple skin cancers with sun exposure. The parents and other relatives are not affected. Which of the following mechanisms is most likely operative to produce neoplasia in these children/

a. HPV infection
b. Failure of nucleotide excision repair of DNA
c. Ingestion of food contaminated with aspergillus flavus
d. Inactivation of p53

Solution. (b) Failure of nucleotide excision repair of DNA
Ref: Read the text below
Sol
- Individuals with another inherited disorder of defective DNA repair, xeroderma pigmentosum, are at increased risk for the development of cancers of the skin particularly following exposure to the UV light contained in sun rays.
- UV radiation causes cross linking of pyrimidine residues, preventing normal DNA replication. Such DNA damage is repaired by the nucleotide excision repair system. Several proteins are involved in nucleotide excision repair, and an inherited loss of any one can give rise to xeroderma pigmentosum.

Correct Answer. b
A 7-year-old child has had abdominal pain and dark urine for 10 days. Physical examination shows purpuric skin lesions on the trunk and extremities. Urinalysis shows both hematuria and proteinuria. Serologic test results are negative for P-ANCAs and C-ANCAs. A skin biopsy specimen shows necrotizing vasculities of small dermal vessels. A renal biopsy specimen shows immune complex deposition in glomeruli, with some IgA-rich immune complexes. Which of the following is the most likely diagnosis?

a. Giant cell arteritis
b. Henoch-Schonlein purpura
c. Polyarteritis nodosa
d. Takayasu arteritis

**Solution.** (b) Henoch-Schonlein purpura Ref. Read the text below Sol
- In childhood, Henoch-Schonlein purpura is the multisystemic counterpart of the IgA nephropathy seen in adults.
- The immune complexes formed with IgA produce the vaculitis that affect mainly arterioles, capillaries, and venules in skin, gastrointestinal tract, and kidney.

**Correct Answer.** b

Amyloidosis is found in following except

a. Multiple myeloma
b. Hypernephroma
c. Thymoma
d. Lymphoma

**Solution.** (c) Thymoma
Ref.: Robbins - 252
Sol:
- Primary amyloid (AL) may occur in multiple myeloma.
- Secondary amyloidosis:
  - It occurs secondary to an associated conditions like —
    o Ankylosing spondylitis
    o Ankylosing spondylitis
    o IBID (Crohn disease, ulcerative colitis)
    o TB & Leprosy
    o Chronic osteomyelitis
    o Bronchiectasis
  - It may also occur in some tumors —
    o Renal cell carcinoma (Hypernephroma)
    o Hodgkin lymphoma

**Correct Answer.** c

Senile cardiac amyloidosis associated protein is

a. Transthyretin
b. ANP
c. Beta 2 microglobin
d. Gelsolin

**Solution.** (a) Transthyretin
Ref.: Robbins - 252
Sol:
- TTR misfolding and aggregation is known to be associated with the amyloid disease: senile systemic amyloidosis (SSA), familial amyloid polyneuropathy (FAP), and familial amyloid cardiomyopathy (FAC).
- TTR tetramer dissociation is known to be rate-limiting for amyloid fibril formation. However, the monomer also must partially denature in order for TTR to be mis-assembly competent, leading to a variety of aggregate structures including amyloid fibrils. While wild type TTR can dissociate, misfold and aggregate leading to SSA, point mutations within TTR are known to destabilize the tetramer composed of mutant and wild type TTR subunits facilitating more facile dissociation and/or misfolding and amyloidogenesis

**Correct Answer.** a
(151). Reversible loss of polarity with abnormality in size and shape of cells is known as

a. Metaplasia
b. Dysplasia
c. Hyperplasia
d. Anaplasia

**Solution.** (b) Dysplasia
Ref.: Robbins 8th/e p. 265
Sol:
- Dysplasia means disordered (abnormal) growth → there is disordered differentiation and maturation.
- This generally consists of an expansion of immature cells, with a corresponding decrease in the number and location of mature cells → there is loss of uniformity of individual cells.
- Dysplastic cells show following feature:
  o Loss of polarity
  o Hyperchromatosis
  o Increased nuclear cytoplasmic size ratio (normal 1 : 4 to 1 : 6).
  o Pleomorphism
  o Increased number of mitosis with normal pattern.

**Correct Answer.** b

(152). A 35 year old man who is known to be infected with HIV complains that he has had a “bad” taste in his mouth and discoloration of his tongue for the past 6 weeks. On physical examination, there are areas of adherent, yellow-tint, circumscribed plaque on the lateral aspects of the tongue. This plaque can be scraped off as a pseudomembrane to show an underlying granular, erythematous base. Which of the following is the most likely diagnosis?

a. Aphthous ulcer
b. Cheilosis
c. Hairy leukoplakia
d. Oral thrush

**Solution.** (d) Oral thrush
Ref- Read the text below
Sol
- The patient has oral thrush, a lesion resulting from oral candidiasis in persons who are immunocompromised.
- The lesion is typically superficial

**Correct Answer.** d

(153). A 10 – year – old child developed a sore throat and fever over a period of 24 hours. Laboratory findings include leukocytosis. The child is given acetylsalicylic acid (aspirin). Which of the following features of the inflammatory response is most affected by this drug?

a. Vasodilation
b. Chemotaxis
c. Phagocytosis
d. Emigration of leukocyte

**Solution.** (a) Vasodilation
Ref- Read the text below
Sol
- Aspirin (acetylsalicylic acid) blocks the cyclooxygenase pathways of arachidonic acid metabolism, which leads to reduced prostaglandin generation.
- Prostaglandins promote vasodilation at sites of inflammation.

**Correct Answer.** a
A woman who is allergic to cats visits a neighbor who has several cats. During the visit, she inhaled cat dander and within minutes, she develops nasal congestion with abundant nasal secretions. Which of the following substances is most likely to produce the findings?

a. Bradykinin
b. Complement CSA
c. Histamine
d. Intermine-1

Solution. (c) Histamine
Ref: Read the text below
Sol:
- Histamine is found in abundance in mast cells, which are normally present in connective tissues next to blood vessels beneath mucosal surfaces in airways.

Correct Answer. c

In lobar pneumonia, the presence of fibrinosuppurative exudates with disintegration of red cells is seen in the stage of

a. Congestion
b. Red hepatization
c. Grey hepatization
d. Resolution

Solution. (c) Grey hepatization
Ref: Read the text below
Sol: Lobar pneumonia usually has an acute progression. Classically, the disease has four stages:
- Congestion in the first 24 hours: This stage is characterized histologically by vascular engorgement, intra-alveolar fluid, small numbers of neutrophils, often numerous bacteria. Grossly, the lung is heavy and hyperemic.
- Red hepatization or consolidation: Vascular congestion persists, with extravasation of red cells into alveolar spaces, along with increased numbers of neutrophils and fibrin. The filling of airspaces by the exudate leads to a gross appearance of solidification, or consolidation, of the alveolar parenchyma. This appearance has been likened to that of the liver, hence the term “hepatization”.
- Grey hepatization: Red cells disintegrate, with persistence of the neutrophils and fibrin. The alveoli still appear consolidated, but grossly the color is paler and the cut surface is drier.
- Resolution (complete recovery): The exudate is digested by enzymatic activity, and cleared by macrophages or by cough mechanism.

Correct Answer. c

The prognosis of rapidly proliferating glomerulonephritis (Crescentic GN) depends upon

a. Number of crescents
b. Size of crescents
c. Shape of crescents
d. Cellularity of crescents

Solution. (a) Number of crescents
Ref: Read the text below
Sol:
- Prognosis can be roughly related to the number of crescents; patients with crescents in less than 80% of the glomeruli have a slightly better prognosis than those with higher percentage of crescents.

Correct Answer. a
(157). All of the following are decreased in nephritic syndrome, except

a. Serum transferrin
b. Serum fibrinogen
c. Serum ceruloplasmin
d. Serum albumin

Solution. (b) Serum fibrinogen
Ref.: Read the text below
Sol:
- Fibrinogen level is increased in nephritic syndrome due to increased hepatic synthesis of fibrinogen.
- The largest proportion of protein lost in urine is albumin. Sometimes, globulins can also be excreted → immunoglobulin excretion increases the susceptibility of infection.
- Other proteins which are decreased —

<table>
<thead>
<tr>
<th>Protein</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferrin</td>
<td>Microcytic hypochromic anemia</td>
</tr>
<tr>
<td>Cholecalciferol binding protein</td>
<td>Hypocalcemia</td>
</tr>
<tr>
<td>Thyroxine binding globulin</td>
<td>Decreased thyroxine level</td>
</tr>
<tr>
<td>Antithrombin III</td>
<td>Hypercoagulability</td>
</tr>
<tr>
<td>Ceruloplasmin</td>
<td></td>
</tr>
</tbody>
</table>

Correct Answer. b

(158). Epimembranous deposition is seen in

a. Good Pasteur syndrome
b. Membranous GN
c. MPGN
d. MCD

Solution. (b) Membranous GN
Ref.: Read the text below
Sol:
- Epimembranous (along the glomerular capillary wall) deposition is seen in membranous GN and Heymann glomerulonephritis.

Correct Answer. b

(159). All are amyloid stains except

a. Congo RED
b. Thioflavin T
c. PAS
d. Brilliant cresyl blue

Solution. (d) Brilliant cresyl blue
Ref: Read the text below
Sol:
- Brilliant cresyl blue and new methylene blue are stains for reticulocytes

Correct Answer. d
(160). Hemodialysis associated amyloid is deposited in

a. Synovium
b. Liver
c. Kidney
d. Tongue

Solution. (a) Synovium
Ref: Read the text below
Sol
- Patients on long-term hemodialysis for renal failure develop amyloidosis as a result of deposition of β₂-microglobulin
- Patients often present with carpal tunnel syndrome because of β₂-microglobulin deposition.
- In some series, over half the patients on long-term dialysis (>20 years) developed amyloid deposits in the synovium, joints, or tendon sheaths.

Correct Answer. a

(161). Transition from G₂ to M phase of the cell cycle is controlled by

a. Retinoblastoma gene product
b. p53 protein
c. Cyclin E
d. Cyclin B

Solution. (d) Cyclin B
Ref: Read the text below
Sol

<table>
<thead>
<tr>
<th>Cyclin</th>
<th>Kinase</th>
<th>Function</th>
</tr>
</thead>
</table>
| D      | CDK4   | 1) Allowing cell to progress through G₁ restriction point  
2) Increased synthesis of cyclin D, A and DNA polymerase |
| E      | CDK2   | Involved in G₂/S transition and DNA synthesis |
| A      | CDK2   | Involved in G₂/M transition |
| B      | CDK-1  | Involved in initiation of mitosis and G₂/M transition |

Correct Answer. d

(162). Growth factor oncogen is

a. Myc
b. Fos
c. Sis
d. Jun

Solution. (c) Sis
Ref: Read the text below
Sol:
- Sis oncogene is a growth factor.
- Myc, jun and fos oncogenes are nuclear regulatory proteins

Correct Answer. c
A 30 year old woman has had coldness and numbness in her arms and decreased vision in the right eye for past 5 month. On physical examination, she is afebrile. Her blood pressure is 100/70 mm Hg. Radial pulses are not palpable but femoral pulses are. She has decreased sensation and cyanosis in her arms but no warmth of swelling. Which of the following is the most likely diagnosis?

a. Aortic dissection
b. Kawasaki disease
c. Microscopic polyangiitis
d. Takayasu arteritis

Solution. (d) Takayasu arteritis
Ref. Read the text below
Sol.
- Takayasu arteritis leads to "pulseless disease" because of involvement of the aorta (particularly the arct) and branches such as coronary, carotid, and renal arteries, with granulomatous inflammation, aneurysm formation, and dissection.
- Fibrosis is a late finding, and the pulmonary arteries can also be involved.

Correct Answer. d

All of the following statements about Hairy cell leukemia are true except

a. Splenomegaly is conspicuous
b. Results from an expansion of neoplastic T lymphocytes
c. Cells are positive for Tartrate Resistant Acid phosphatase
d. The cells express CD25 consistently

Solution. (b) Results from an expansion of neoplastic T lymphocytes
Ref.: Read the text below
Sol.:
- Hairy cell leukemia is a 'B' cell neoplasm and is characterized by expansion of neoplastic B cells.
- Cytochemistry and immunophenotyping of hairy cells.
- Tartrate resistant acid phosphatase (TRA).
- Hairy cells are associated with an isoenzyme of acid phosphatase, i.e., acid phosphatase, i.e., acid phosphatase isoenzyme 5, in the cytoplasm which unlike other isoenzymes is resistant to tartrate.
- B-cell associated markers
  o CD 19, CD20, CD22
  o Either K or λ light chain
  o Surface IgG
- Others
  o CD 25
  o CD 103 → It presence is diagnostic for HCL
  o CD 11c

Correct Answer. b

Sezary syndrome is included in category of

a. T cell leukemia
b. Lymphoma
c. B cell leukemia
d. Pigmented disorder of skin

Solution. (a) T cell leukemia
Ref.: Read the text below
Sol.:
- Mycosis fungoides & Sezary syndrome appear to be a different manifestations of a single neoplastic entity.
- It is an indolent disorder of peripheral CD4T cells that is characterized by the involvement of skin & therefore belong to the group of cutaneous T cell lymphoid neoplasms.

Correct Answer. a
(166). A patient presenting with haemoptysis and renal failure with antibasement membrane antibodies has

a. Good pasture’s syndrome

b. Wegener’s syndrome

c. Churg Strauss syndrome

d. Henoch-scholein purpura

**Solution.** (a) Good pasture’s

Ref.: Read the text below

Sol:
- Goodpasture’s syndrome (also known as Goodpasture’s disease and anti-glomerular basement antibody disease) is a rare autoimmune disease in which antibodies attack the lungs and kidneys, leading to bleeding from the lungs and to kidney failure. It may quickly result in permanent lung and kidney damage, often leading to death. It is treated with immunosuppressant drugs such as corticosteroids and cyclophosphamide, and with plasmapheresis, in which the antibodies are removed from the blood.
- The specific target of the immune attack is the **GBM antigen**, which is found in the lungs and kidneys. The antigen is a component of the non-collagenous 1 (NC1) domain of the alpha-3 chain of type IV collagen in the **glomerular basement membrane**.
- Goodpasture’s syndrome is a **type II hypersensitivity reaction**

**Correct Answer.** a

(167). What percent of giant cell tumor of bone are malignant?

a. 5 – 10%

b. 15 – 20%

c. 25 – 30%

d. 50 – 60%

**Solution.** (a) 5 – 10%

Ref: Read the text below

Sol:
- Giant cell tumors are commonly benign.
- The tumors are malignant in 5-10% of patients
- Malignant giant cell tumors of bone usually result from secondary malignant transformation after radiation treatment

**Correct Answer.** a

(168). Spindle cell is seen in:

a. Sarcoma

b. Lymphoma

c. Carcinoma

d. None

**Solution.** (a) Sarcoma

Ref: Read the text below

Sol:
- Two cell types can be seen microscopically in synovial sarcoma. One fibrous type, known as a spindle or sarcomatous cell, is relatively small and uniform, and found in sheets. The other is epithelial in appearance.
- Classical synovial sarcoma has a biphasic appearance with both types present. Synovial sarcoma can also appear to be poorly differentiated or to be monophasic fibrous, consisting only of sheets of spindle cells. Some authorities state that, extremely rarely, there can be a monophasic epithelial form which causes difficulty in differential diagnosis.
- Like other soft tissue sarcomas, there is no universal grading system for reporting histopathology results.
- In Europe, the Trojani or French system is gaining in popularity while the NCI grading system is more common in the United States. The Trojani system scores the sample, depending on tumour differentiation, mitotic index, and tumour necrosis, between 0 and 6 and then converts this into a grade of between 1 and 3, with 1 representing a less aggressive tumour. The NCI system is also a three-grade one, but takes a number of other factors into account.

**Correct Answer.** a
(169). The chromosomal anomaly seen in Burkitt’s lymphoma is:

a. t (8 : 14)
b. t (14 : 18)
c. t (2 : 13)
d. t (1 : 13)

Solution. (a) t (8 : 14)
Ref: Read the text below
Sol:
All types of Burkitt’s lymphoma are characterized by disregulation of the \textit{c-myc} gene by one of three chromosomal translocations. This gene is found at 8q24.
- The most common variant is t(8;14)(q24;q32), which accounts for approximately 85% of cases. This involves \textit{c-myc} and IGH. A variant of this, a three-way translocation, t(8;14;18), has also been identified.
- A rare variant is at t(2;8)(p12;q24).
- Another rare variant is t(8;22)(q24;q11).
- Combined, the two less-common translocations, t(2;8)(p12;q24) and t(8;22)(q24;q11), account for the remaining 15% of cases not due to the t(8;14)(q24;q32) translocation

Correct Answer. a

(170). All are autosomal recessive disorders except:

a. Hereditary spherocytosis
b. Sickle-Cell Disease
c. Tay-Sachs disease
d. Cystic fibrosis

Solution. (a) Hereditary spherocytosis
Ref: Read the text below
Sol:
- Two copies of the gene must be mutated for a person to be affected by an autosomal recessive disorder.
- An affected person usually has unaffected parents who each carry a single copy of the mutated gene (and are referred to as carriers). Two unaffected people who each carry one copy of the mutated gene have a 25% chance with each pregnancy of having a child affected by the disorder.
- Examples of this type of disorder are \textit{cystic fibrosis, sickle-cell disease, Tay-Sachs disease, Niemann-Pick disease, spinal muscular atrophy, and Roberts syndrome}. Certain other phenotypes, such as wet versus dry \textit{earwax}, are also determined in an autosomal recessive fashion.

Correct Answer. a

(171). Lacunar cells are seen in which type of Hodgkin’s lymphoma?

a. Nodular sclerosis
b. Mixed cellularity
c. Lymphocyte predominant
d. Lymphocyte depleted

Solution. (a) Nodular sclerosis
Ref: Read the text below
Sol:
- Nodular sclerosis (or "NSHL") is a form of \textit{Hodgkin’s lymphoma} that is the most common subtype of HL in developed countries. It affects females and males equally and has a median age of onset at ~28 years. It is composed of large tumor nodules with lacunar \textit{Reed-Sternberg cell} (RS cells) surrounded by fibrotic collagen bands.
- The British National Lymphoma Investigation further categorized NSHL based upon Reed-Sternberg cells into "nodular sclerosis type I" (NS I) and "nodular sclerosis type II" (NS II), with the first subtype responding better to treatment

Correct Answer. a
(172). A 50-year-old man has a 2-year history of angina pectoris that occurs during exercise. On physical examination, his blood pressure is 135/75 mm Hg, and his heart rate is 79/mm and slightly irregular. Coronary angiography shows a fixed 75% narrowing of the anterior descending branch of the left coronary artery. Which of the following types of cells is the initial target in the pathogenesis of this arterial lesion?

a. Monocytes
b. Smooth muscle cells
c. Platelets
d. Endothelial cells

**Solution.** (d) Endothelial cells
Ref: Read the text below
Sol:
- Artherogenesis can be considered a chronic inflammatory response of the arterial wall to endothelial injury.

**Correct Answer.** d

(173). The liver biopsy given below shows which of the following?

a. Chronic Hepatitis B
b. Chronic Hepatitis C
c. Acute Hepatitis B
d. Acute Hepatitis C

**Solution.** (b) Chronic Hepatitis C
Ref: Read the text below
Sol:
- Ground glass hepatocytes, characterized by more pale, eosinophilic, and homogeneous cytoplasm than surrounding normal (more granular) hepatocytes.
- Note (artifactual) cleft between ‘ground glass’ cytoplasm and hepatocellular cell membrane.
- The first nucleated hepatocyte in the left lower corner reveals a less pronounced ‘ground glass’ appearance (corresponding to less extensive endoplasmic reticulum hyperplasia and less massive accumulation of HBsAg).

**Correct Answer.** b
Presence of Reed-Sternberg cells favors the diagnosis of?

a. Hodgkin lymphoma

b. Non-hodgkin lymphoma

c. Metastatic testicular cancer

d. Acute lymphocytic leukemia

Solution. (a) Hodgkin lymphoma

Ref: Read the text below

Sol:
- The Reed-Sternberg cell can be classified as the classic type, the mononuclear variant, the lymphocytic histiocytic variant, lacunar and pleomorphic variant.
- The classic Reed-Sternberg cell is a binucleated cell that contains an ovoid-shaped nucleus with regular contours and prominent eosinophilic nucleoli. Cytoplasm is abundant and eosinophilic.
- On cytogenetic studies, the Reed-Sternberg cells are either aneuploid or frequently hypertetraploid. The classic Reed-Sternberg cell is thought to be an end-stage cell that does not divide.
- The mononuclear variants of the Reed-Sternberg cells (so-called Hodgkin cells) could be identified in any type of Hodgkin disease, but they are not diagnostic of Hodgkin’s.

Correct Answer. a

A 54-year-old woman has a dilation and curettage procedure for the evaluation of postmenopausal bleeding. Which of the following pathologic diagnoses would carry the most favorable prognosis for the patient?

a. Well-differentiated adenocarcinoma with a squamous differentiation

b. Serous carcinoma

c. Clear cell adenocarcinoma

d. Carcinosarcoma

Solution. (a) Well-differentiated adenocarcinoma with a squamous differentiation

Ref: Read the text below

Sol:
- One-third of all endometrial adenocarcinomas contain squamous cells, in addition to glandular elements.
- If the squamous element is well differentiated with no more than minimal atypia, the tumor is called well-differentiated adenocarcinoma with squamous differentiation.
- These tumors enjoy a better prognosis stage-by-stage compared with all of the others listed in the question. These tumors are less common and they show an aggressive behavior. The histologic grading, therefore, is not of clinical value.
- These aggressive tumors are serous carcinoma, clear cell adenocarcinoma, carcinosarcoma

Correct Answer. a
With idiopathic Parkinson disease, Lewy bodies are typically found in the:

a. Substantia nigra

b. Nucleus basalis of Meynert

c. Dorsal raphe

d. All of the above

Solution. (d) All of the above.

Ref: Read the text below

Sol:
- The clinical presentation of Lewy body disease varies according to the site of Lewy body formation and associated neuronal loss. In Parkinson disease, the Lewy bodies are found in the substantia nigra of the midbrain, coupled with the loss of pigmented neurons. In persons with the dementia of diffuse Lewy body disease, there are Lewy bodies in the neocortex. Some persons have the Lewy bodies in both locations.
- The basal ganglia and diencephalon may also be involved in some cases.
- Lewy bodies are spherical, intraneuronal, cytoplasmic, eosinophilic inclusions comprising abnormally truncated and phosphorylated intermediate neurofilament proteins, alpha-synuclein, ubiquitin, and associated enzymes.
- With idiopathic Parkinson disease, Lewy bodies are typically found in the substantia nigra, nucleus basalis of Meynert, dorsal raphe, locus ceruleus, dorsal motor nucleus of the vagus nerve, and hypothalamus. In cases Lewy body dementia, cortical Lewy bodies are prominent, but there are typically findings of Alzheimer disease as well.

Correct Answer. d

Which of the following is true regarding NHL

a. BCL6 is associated with Burkitt Lymphoma

b. BCL2 is associated with mantle cell lymphoma and follicular lymphoma

c. CD 34 associated with DPFL

d. CD 10 is associated with mantle cell lymphoma

Solution. (a) BCL6 is associated with Burkitt Lymphoma

Ref: Read the text below

Sol: Burkitt Lymphoma
- Tumor of B cell lineage
- Express surface IGM
- Monotypic may be K or Lambda type
- CD 10, CD19, CD20+
- BCL6 +
- C-MYC + translocation pattern IGH locus T(8;14), KT (2;8). Or lambda t(8;22)

Mantle Cell Lymphoma
- CD 19, CD 20 +
- With high level surface IGM or IGD either Kappa or Lambda type
- CD5+
- CD23-
- Cyclin d1 protein+
- T(I1;14)

Follicular Lymphoma
- CD 10, CD 19, CD20+
- CD5-
- BCL2+
- BCL6+ T (14;18)

Correct Answer. a
(178). Common sites of metastases from primary lung cancer include all of the following except:

a. Adrenal glands  
b. Spleen  
c. Bones  
d. Brain  

**Solution.** (b) Spleen  
Ref: Read the text below.  
Sol:  
- Metastatic neoplasms of the lungs and pleura are more common than primary neoplasms.  
- Such metastases occur in about 25 percent of all fatal malignant neoplasms.  
- The most common neoplasms giving rise to pulmonary or pleural metastases are carcinoma of the breast, gastrointestinal tract, kidneys, and malignant melanoma.  
- Neoplastic cells may reach the lung by direct extension, pulmonary arterial embolism, or retrograde lymphatic extension from the mediastinal lymph nodes.  

**Correct Answer.** b

(179). "Rod bodies" seen in Rod body myopathy are believed to be derived from:

a. Motor end plate  
b. Z lines of myofibrils  
c. Sarcodermal sheath  
d. Not known  

**Solution.** (b) Z lines of myofibrils  
Ref: Read the text below  
Sol:  
- Nemaline, or rod, myopathies are a group of conditions which fall under the umbrella of congenital myopathies.  
- They are characterised by rod-like structures in the muscle cells, and clinical features such as muscle weakness, breathing problems, and feeding problems.  
- There are 6 sub-groups which are defined according to age of onset and severity. Around 1 in 50,000 individuals are estimated to be affected, and these include both males and females.  
- There is currently no effective treatment or cure to halt the progression, but management of the condition is very important and includes physiotherapy, and where necessary the use of ventilation and/or a feeding tube.  
- Rod bodies seen in Rod body myopathy are believed to be derived from Z lines of myofibrils  

**Correct Answer.** b

(180). Cytogenetics for synovial cell sarcoma is –

a. T (X : 18)  
b. T (17, 19)  
c. T (9, 22)  
d. T (11, 14)  

**Solution.** (a) T (X : 18)  
Ref: Robbin’s - 1249  
Sol: Synovial cell sarcoma (SCS)  
- Synovial cell sarcoma forms about 10% of all soft tissue sarcomas. Although the name suggests an origin from the synovial linings, less than 10% of them are intra-articular.  
- Most synovial sarcomas show a characteristic chromosomal translocation t (X : 18) producing SYT-SS XI or SS X 2 fusion genes. The specific translocation is associated with poor prognosis.  
- Calcified concretions can be present on Xrays.  
- This tumor is positive for – Keratin, Epithelial membrane antigen.  

**Correct Answer.** a
(181). “Biphasic pattern” on histology is seen in which tumor -

a. Rhabdomyosarcoma

b. Synovial cell sarcoma

c. Osteosarcoma

d. Neurofibroma

**Solution.** (b) Synovial cell sarcoma
Ref: Robbin’s - 1254
Sol:
- In synovial cell sarcoma characteristic biphasic pattern seen i.e, Epithelial cells sharply segregated by sarcomatoid cells.

Correct Answer. b

(182). Alpha feto protein is a tumor marker of

a. Hepatoblastoma

b. Nephroblastoma

c. Seminoma

d. Oat cell carcinoma

**Solution.** (a) Hepatoblastoma
Ref: Read the text below
Sol:

<table>
<thead>
<tr>
<th></th>
<th>Hepatoblastoma</th>
<th>HCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age at Presentation</td>
<td>1y</td>
<td>12y</td>
</tr>
<tr>
<td>Male to Female Ratio</td>
<td>1.7:1</td>
<td>1.4:1</td>
</tr>
<tr>
<td>Pathologic Feature</td>
<td>Fetal or Embryonic Cells, Mesenchymal Components (50%)</td>
<td>Large Pleomorphic Tumor Cells and Tumor Giant Cells</td>
</tr>
<tr>
<td>Associated condition</td>
<td>Hemihyper trophy, Beckwith Wiedmann Syndrome, Prematurity, Gardner Syndrome</td>
<td>Hepatitis B, Hereditary Tyrosinemia, Biliary Cirrhosis, Alpha 1 Antitrypsin Deficiency</td>
</tr>
<tr>
<td>Solitary Hepatic Lesion</td>
<td>80%</td>
<td>20-50%</td>
</tr>
<tr>
<td>Unique Feature at Diagnosis</td>
<td>Osteopenia, Isosexual Precocity</td>
<td>Hemoperitoneum, Polycythemia</td>
</tr>
<tr>
<td>Lab. Finding:</td>
<td>5%</td>
<td>25%</td>
</tr>
<tr>
<td>hyperbilirubinemia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevated AFP</td>
<td>&gt;90%</td>
<td>50%</td>
</tr>
<tr>
<td>Abnormal Liver Function Test</td>
<td>15-30%</td>
<td>&gt;30-50%</td>
</tr>
</tbody>
</table>

Correct Answer. a
(183). HLAB27 is positive in

a. Ankylosing spondylosis

b. RA

c. SLE

d. Sjögren syndrome

Solution. (a) Ankylosing spondylosis

Ref: Read the text below

Sol:

<table>
<thead>
<tr>
<th>Spondyloarthropathies</th>
<th>B27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ankylosing spondylitis</td>
<td></td>
</tr>
<tr>
<td>Reiter’s syndrome</td>
<td></td>
</tr>
<tr>
<td>Acute anterior uveitis</td>
<td></td>
</tr>
<tr>
<td>Reactive arthritis (Yersinia, Salmonella, Shigella, Chlamydia)</td>
<td></td>
</tr>
<tr>
<td>Psoriatic spondylitis</td>
<td></td>
</tr>
</tbody>
</table>

Correct Answer. a

(184). Which of the following is an example of instability of chromosome

a. Ataxia telangiectasia

b. Downs syndrome

c. Kliffel feil syndrome

d. None of above

Solution. (a) Ataxia telangiectasia

Ref: Read the text below

Sol:

ATAXIA-TELANGIECTASIA
- Ataxia-telangiectasia (AT) is an autosomal recessive genetic disorder characterized by cerebellar ataxia, oculocutaneous telangiectasia, and immunodeficiency.
- The mutant ATM gene has sequence similarity to the phosphatidylinositol-3 kinases that are involved in signal transduction.
- The ATM gene belongs to a conserved family of genes that monitor DNA repair and coordinate DNA synthesis with cell division.
- The deleterious effects of the ATM gene are widespread. Truncal ataxia may become evident when walking begins and is progressive.
- Telangiectasia, primarily represented by dilated blood vessels in the ocular sclera, in a butterfly area of the face, and on the ears, is an early diagnostic feature. Immunodeficiency may be clinically manifest by recurrent and all patients have overt immunodeficiency.
- Ovarian agenesis is a frequent occurrence.
- Persistence of very high serum levels of oncofetal proteins, including fetoprotein and carcinoembryonic antigen, may be of diagnostic value.
- Frequent causes of death are chronic pulmonary disease and malignancy.
- Lymphomas are most common, although carcinomas also occur.
- The immunologic abnormalities seem to be related to maldevelopment of the thymus.
- The markedly hypoplastic thymus is similar in appearance to an embryonic thymus.
- The peripheral T cell pool is reduced in size, especially in lymphoid tissue compartments. Cutaneous anergy and delayed rejection of skin allografts are common.
- B lymphocyte development is normal, most patients are deficient in serum IgE and IgA, and a smaller number have reduced serum levels of IgG, particularly of the IgG2, IgG4 subclasses.
- The defect in DNA repair mechanisms in AT patients renders their cells highly susceptible to radiation-induced chromosomal damage and resultant tumor development.

Correct Answer. a
(185). Guillain-Barre’ is not linked to which of the following statements?

a. Infections often present

b. Greater initial upper extremity deficits

c. Facial weakness

d. Orthostatic Hypotension

**Solution.** (b) Greater initial upper extremity deficits

Ref: Read the text below

Sol:

- The disorder is characterized by symmetrical weakness which usually affects the lower limbs first, and rapidly progresses in an ascending fashion. Patients generally notice weakness in their legs, manifesting as "rubbery legs" or legs that tend to buckle, with or without dysesthesias (numbness or tingling).

- As the weakness progresses upward, usually over periods of hours to days, the arms and facial muscles also become affected. Frequently, the lower cranial nerves may be affected, leading to bulbar weakness, (opharyngeal dysphagia, that is difficulty with swallowing, drooling, and/or maintaining an open airway) and respiratory difficulties.

- Facial weakness is also a common feature, but eye movement abnormalities are not commonly seen in ascending GBS, but are a prominent feature in the Miller-Fisher variant (see below.)

- Fever should not be present, and if it is, another cause should be suspected.

- In severe cases of GBS, loss of autonomic function is common, manifesting as wide fluctuations in blood pressure, orthostatic hypotension, and cardiac arrhythmias.

- Acute paralysis in Guillain-Barré syndrome may be related to sodium channel blocking factor in the cerebrospinal fluid (CSF). Significant issues involving intravenous salt and water administration may occur unpredictably in this patient group, resulting in SIADH.

- The symptoms are similar to those for progressive inflammatory neuropathy.

**Correct Answer.** b

(186). Pancoast's tumor is not linked to which of the following statements?

a. Horner’s syndrome

b. Anhidrosis

c. Brachial Plexus involvement

d. Arthritis

**Solution.** (d) Arthritis

Ref: Read the text below

Sol:

- Aside from cancer general symptoms such as malaise, fever, weight loss and fatigue, pancoast tumor can include a complete Horner's syndrome in severe cases: miosis (constriction of the pupils), anhidrosis (lack of sweating), ptosis (drooping of the eyelid) and enophthalmos (sunken eyeball).

- In progressive cases, the brachial plexus is also affected, causing pain and weakness in the muscles of the arm and hand.

- The tumor can also compress the right recurrent laryngeal nerve, and from this a hoarse voice and bovine cough may occur.

**Correct Answer.** d

(187). Wermer's syndrome is considered a?

a. MEN type I

b. MEN type II

c. MEN type III

d. MEN type IV

**Solution.** (a) MEN type I

Ref: Read the text below

Sol:

- Multiple endocrine neoplasia type 1 (MEN-1 syndrome) or Wermer syndrome is part of a group of disorders that affect the endocrine system.

- These disorders greatly increase the risk of developing multiple cancerous and noncancerous tumors in glands such as the parathyroid, pituitary, and pancreas. Multiple endocrine neoplasia occurs when tumors are found in at least two endocrine glands.

- Tumors can also develop in organs and tissues other than endocrine glands. If the tumors become cancerous, some cases can be life-threatening. The disorder affects 1 in 30,000 people.

**Correct Answer.** a
(188). A 52-year-old woman has biopsy of a breast lesion which confirms the mass as malignant. She is also found to clinically have a palpable ipsilateral axillary lymph node. Which of the following would be the most likely pathologic finding in this node?

a. Follicular hyperplasia  
b. Paracortical hyperplasia  
c. Granulomatous inflammation  
d. Sinus histiocytosis  

Solution. (d) Sinus histiocytosis  
Ref: Read the text below  
Sol:  
- Sinus histiocytosis represents hyperplasia of the endothelial lining of the sinusoids, which become dilated and contain many histiocytes.  
- This reaction, which is also called reticular hyperplasia, becomes very prominent in lymph nodes when they are draining a cancerous process. This is particularly common in the axillary nodes when cancer of the breast has been detected.  
- It is thought to represent an immune response to the host against the tumor products  

Correct Answer. d

(189). A history of which of the following conditions would result in the greatest increase in the likelihood of developing colon cancer?

a. Crohn's disease  
b. Hamartomatous polyp  
c. Pseudomembranous colitis  
d. Ulcerative colitis  

Solution. (d) Ulcerative colitis  
Ref: Read the text below  
Sol:  
- Ulcerative colitis is an inflammatory disease of uncertain etiology that has a relapsing course.  
- Patients with ulcerative colitis have a higher than normal incidence of developing colon carcinoma, approximately 10%.  

Correct Answer. d

(190). Which of the following is the most common characteristic of a serous cystadenocarcinoma of the ovary?

a. It causes pseudomyxoma peritonei.  
b. It is composed of transitional epithelial cells.  
c. It is frequently bilateral  
d. It often metastasizes to the brain  

Solution. (c) It is frequently bilateral.  
Ref: Read the text below  
Sol:  
- Serous cystadenocarcinoma of the ovary is the most common malignant ovarian tumor and is frequently bilateral. Microscopically, they show a variegated appearance with papillary pattern.  
- Different degrees of anaplasia of the cuboidal to columnar cells cover the papilla and occasional calcified concretions (Psammoma bodies) are present.  
- These tumors almost never metastasize to the brain and they are not seen in children or young adults.  

Correct Answer. c
(191). A 28-year-old female shows clinical manifestations related to secretion of excess androgenic hormones and persistent anovulation. What would be the most likely finding in the ovary?

a. Endometriosis
b. Polycystic ovary
c. Endometrioid carcinoma of the ovary
d. Granulosa cell tumor of the ovary

Solution. (b)Polycystic ovary
Ref: Read the text below
Sol:
- Polycystic ovary syndrome is characterized by clinical manifestations related to the secretions of excess of androgen hormones.
- There is usually a persistent anovulation, resulting clinically in irregular or absent menstruation.
- The ovaries are moderately enlarged and contain many small cysts located in the cortex.

Correct Answer. b

(192). A small area of abnormality is noted on the lateral wall of the urinary bladder during a cystoscopy on a patient being evaluated for asymptomatic microscopic hematuria. Biopsy of the lesion is most likely to reveal which of the following?

a. Neuroendocrine carcinoma
b. Rhabdomyosarcoma
c. Squamous cell carcinoma
d. Papillary transitional cell carcinoma

Solution. (d)Papillary transitional cell carcinoma
Ref: Read the text below
Sol:
- Papillary cancer arises most frequently from the lateral and posterior bladder walls.
- At cystoscopy, tumors may be small, delicate, low-grade papillary lesions limited to the mucosal surface or larger high grade, solid, and invasive which are often ulcerated.
- Papillary and exophitic cancers tend to be better differentiated.
- Infiltrating tumors are usually more anaplastic. Nonurothelial forms of bladder cancer are squamous cell carcinomas, adenocarcinomas, neuroendocrine carcinomas, and rhabdomyosarcomas. The frequency of these tumors is much lower.

Correct Answer. d

(193). A 60-year-old male developed painless hematuria. On further clinical evaluation, a CT scan showed a 7 cm mass on the lower pole of the right kidney. Most likely diagnosis in this case?

a. Neuroblastoma
b. Medullary fibroma
c. Wilms tumor
d. Renal cell carcinoma

Solution. (d)Renal cell carcinoma
Ref: Read the text below
Sol:
- The most important and frequent cause of painless hematuria is renal cell carcinoma.
- This symptom is usually associated with a palpable mass on the flank, as well as costovertebral pain.
- Occasionally, renal cell carcinomas are associated with a paraneoplastic syndrome, which includes polycythemia, hypercalcaemia, hypertension, feminization or masculinization, Cushing syndrome, and so on.
- The other answers listed are mostly seen in children. Transitional cell carcinoma is rarer than renal cell carcinoma and medullary fibroma is a benign tumor.

Correct Answer. d
Which of the following is not directly related with Sarcoidosis?
Sarcoidosis also called sarcoid or Besnier-Boeck disease, is a multisystem granulomatous inflammatory disease characterized by non-caseating granulomas (small inflammatory nodules). The cause of the disease is still unknown. Granulomas most often appear in the lungs or the lymph nodes, but virtually any organ can be affected. Symptoms usually appear gradually but can occasionally appear suddenly. The clinical course generally varies and ranges from asymptomatic disease to a debilitating chronic condition that may lead to death.

Correct Answer. d
(195). Which of the following is not a risk factor for hypertension?

a. Genetics
b. Low birth weight
c. Youth
d. Smoking

Solution. (c) Youth

Ref: Read the text below

Sol:
- While one of the most common disorders, essential hypertension, by definition idiopathic, has an unknown cause. It is the most prevalent hypertension type, affecting 90-95% of hypertensive patients.
- Although no direct cause has identified itself, there are many factors such as sedentary lifestyle, Stress, visceral obesity, potassium deficiency (hypokalemia), obesity (more than 85% of cases occur in those with a body mass index greater than 25), salt (sodium) sensitivity, alcohol intake, and vitamin D deficiency.
- Risk also increases with aging, some inherited genetic mutations and family history. An elevation of Renin, an enzyme secreted by the kidney, is another risk factor, as is sympathetic nervous system overactivity.
- Insulin resistance which is a component of syndrome X, or the metabolic syndrome is also thought to contribute to hypertension. Recent studies have implicated low birth weight as a risk factor for adult essential hypertension.

Correct Answer. c

(196). A full-term baby boy was noted in the immediate neonatal period to fail to pass meconium. Progressive abdominal distention was noted. Multiple laboratory and clinical tests lead to a decision to perform a rectal biopsy. What is the most important histologic finding that you expect to see in the rectal biopsy?

a. Ischemic necrosis of the bowel mucosa
b. Acute ulcerative colitis
c. Granulomatous inflammation
d. Absence of ganglion cells in the rectal mucosa and submucosa

Solution. (d) Absence of ganglion cells in the rectal mucosa and submucosa

Ref: Read the text below

Sol:
- Hirschsprung disease usually manifests in the immediate neonatal period by failure to pass meconium, followed by obstructive constipation. Abdominal distention develops and, in general, a large segment of the colon is involved and distended.
- The incidence of Hirschsprung disease is 1 in 5000 live births, with an 80% male predominance in nonfamilial cases. There is no apparent difference in occurrence among races.
- A number of abnormalities have been associated with Hirschsprung disease, including Down syndrome (2-3% of the cases), congenital heart disease, colonic atresia, and malrotation.
- The tissue diagnosis is made on the basis of an absence of ganglion cells in the submucosa and the myenteric plexus on a full-thickness rectal biopsy. Some surgeons prefer suction biopsy to full-thickness biopsy because it is easy to obtain the specimen and they can avoid scarring and fibrosis in the area.
- The other choices are not applicable and can be ruled out on the basis of clinical history and an extremely low incidence of other pathologic conditions at the perinatal age.

Correct Answer. d
(197). What special stains would you use that would be helpful to confirm the finding of ganglion cells in Hirschsprung disease

a. Periodic acid-Schiff (PAS)

b. Mucicarmine

c. Trichrome stain

d. Acetylcholinesterase

**Solution.** (d) Acetylcholinesterase

Ref: Read the text below

Sol:
- When suction biopsies are performed for hirschsprung disease, the tissue sample for acetylcholinesterase stain should be frozen as soon as possible.
- All of the other stains would not be helpful to identify ganglion cells. As soon as the diagnosis is confirmed with the rectal biopsy, a surgical procedure should be undertaken that consists of a resection of the aganglionic section of colon.

**Correct Answer.** d

(198). The following gross specimen of gall bladder shows

a. Acute cholecystitis

b. Chronic cholecystitis

c. Cholesterolosis

d. Adenomyomatosis

**Solution.** (c) Cholesterolosis

Ref: Read the text below

Sol:
- Cholesterosis of the gallbladder occurs, for the most part, in multiparous women.
- The gross appearance is characteristic: linear yellow streaks are seen in the prominences of the ridges, surrounded by a congested mucosa ('strawberry gallbladder')

**Correct Answer.** c
(199). All of the following protoncogenes undergo overexpression to become oncogenic except
a. FGF
b. JAK/STAT
c. PDGFR
d. HGF

Solution. B
JAK/STAT protein involved in signal transduction undergoes translocations in myeloproliferative disorders and acute lymphoblastic leukemia.

Correct Answer. b

(200). All of the following have been implicated in causation of lung carcinoma except
a. Radon
b. Cadmium
c. Beryllium
d. Nickel compounds

Solution. B
Arsenic, asbestos, beryllium, chromium, nickel, radon and its decay products are all implicated in causing lung cancer. Cadmium and cadmium compounds are implicated in prostate cancer.

Correct Answer. b

<table>
<thead>
<tr>
<th>Test Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.(d) 2.(a) 3.(c) 4.(d) 5.(b) 6.(d) 7.(b) 8.(c) 9.(b) 10.(a)</td>
</tr>
<tr>
<td>11.(a) 12.(c) 13.(c) 14.(a) 15.(c) 16.(d) 17.(b) 18.(c) 19.(b) 20.(a)</td>
</tr>
<tr>
<td>21.(d) 22.(c) 23.(a) 24.(d) 25.(b) 26.(c) 27.(c) 28.(c) 29.(a) 30.(d)</td>
</tr>
<tr>
<td>31.(a) 32.(c) 33.(c) 34.(c) 35.(d) 36.(a) 37.(c) 38.(c) 39.(a) 40.(c)</td>
</tr>
<tr>
<td>41.(a) 42.(d) 43.(d) 44.(b) 45.(d) 46.(c) 47.(d) 48.(a) 49.(d) 50.(d)</td>
</tr>
<tr>
<td>51.(b) 52.(d) 53.(d) 54.(c) 55.(b) 56.(d) 57.(b) 58.(a) 59.(d) 60.(a)</td>
</tr>
<tr>
<td>61.(c) 62.(a) 63.(c) 64.(d) 65.(d) 66.(a) 67.(d) 68.(c) 69.(c) 70.(d)</td>
</tr>
<tr>
<td>71.(c) 72.(a) 73.(d) 74.(b) 75.(d) 76.(a) 77.(b) 78.(c) 79.(a) 80.(c)</td>
</tr>
<tr>
<td>81.(d) 82.(d) 83.(d) 84.(a) 85.(d) 86.(d) 87.(b) 88.(c) 89.(b) 90.(c)</td>
</tr>
<tr>
<td>91.(d) 92.(c) 93.(c) 94.(d) 95.(d) 96.(b) 97.(b) 98.(a) 99.(d) 100.(c)</td>
</tr>
<tr>
<td>101.(b) 102.(c) 103.(b) 104.(b) 105.(b) 106.(d) 107.(d) 108.(c) 109.(c) 110.(c)</td>
</tr>
<tr>
<td>111.(a) 112.(b) 113.(d) 114.(d) 115.(b) 116.(c) 117.(c) 118.(b) 119.(c) 120.(d)</td>
</tr>
<tr>
<td>121.(b) 122.(c) 123.(c) 124.(d) 125.(c) 126.(b) 127.(c) 128.(c) 129.(c) 130.(c)</td>
</tr>
<tr>
<td>131.(c) 132.(c) 133.(a) 134.(c) 135.(b) 136.(c) 137.(c) 138.(a) 139.(a) 140.(a)</td>
</tr>
<tr>
<td>141.(c) 142.(d) 143.(d) 144.(b) 145.(d) 146.(c) 147.(b) 148.(b) 149.(c) 150.(a)</td>
</tr>
<tr>
<td>151.(b) 152.(d) 153.(a) 154.(c) 155.(c) 156.(a) 157.(b) 158.(b) 159.(d) 160.(a)</td>
</tr>
<tr>
<td>161.(d) 162.(c) 163.(d) 164.(b) 165.(a) 166.(a) 167.(a) 168.(a) 169.(a) 170.(a)</td>
</tr>
<tr>
<td>171.(a) 172.(d) 173.(b) 174.(a) 175.(a) 176.(d) 177.(a) 178.(b) 179.(b) 180.(a)</td>
</tr>
<tr>
<td>181.(b) 182.(a) 183.(a) 184.(a) 185.(b) 186.(d) 187.(a) 188.(d) 189.(d) 190.(c)</td>
</tr>
<tr>
<td>191.(b) 192.(d) 193.(d) 194.(d) 195.(c) 196.(d) 197.(d) 198.(c) 199.(b) 200.(b)</td>
</tr>
</tbody>
</table>