M- 007M

MBBS 2nd PROFESSIONAL EXAMINATION, 2022

PATHOLOGY

Paper I

Time Allowed: Three Hours **Maximum Marks- 100**

Note: *Attempt all questions in serial order. Answer Section-A and Section-B in separate answer books. All parts of a question should be answered together. Illustrate your answer with suitable diagram where required. Figures in parenthesis indicate marks allotted to a question.*

Section-A

Q1. Discuss the inflammation and about various mediators and pathophysiology of acute inflammation. **(20)**

Q2. Write briefly on: **(4x5)**

a) Granulomatous inflammation
b) Apoptosis
c) Complement system
d) Microbial Carcinogenesis

Q3. Multiple Choice Questions: **(10x1)**

1. **A 50-year-old chronic alcoholic presents to the emergency room with 12 hours of severe abdominal pain. The pain radiates to the back and is associated with an urge to vomit. Physical examination discloses exquisite abdominal tenderness. Laboratory studies show elevated serum amylase. Which of the following morphologic changes would be expected in the peripancreatic tissue of this patient?**
   a) Coagulative necrosis
   b) Caseous necrosis
   c) Fat necrosis
   d) Fibrinoid necrosis
2. **A 38-year-old woman shows evidence of early cataracts, hair loss, atrophy of skin, osteoporosis, and accelerated atherosclerosis. This patient has most likely inherited mutations in both alleles of a gene that encodes which of the following types of intracellular proteins?**
   a) Deaminase
   b) Helicase
   c) Oxidase
   d) Polymerase
3. **A 33-year-old man presents with a 5-week history of calf pain and swelling and low-grade fever. Serum levels of creatine kinase are elevated. A muscle biopsy reveals numerous eosinophils. What is the most likely etiology of this patient's myalgia?**
   a) Autoimmune disease
   b) Bacterial infection
   c) Muscular dystrophy
   d) Parasitic infection

4. **A 25-year-old woman presents with a history of febrile illness and chest pain. She has an erythematous, macular facial rash and tender joints, particularly in her left wrist and elbow. A CBC shows mild anemia and thrombocytopenia. Corticosteroids are prescribed for the patient. This medication induces the synthesis of an inhibitor of which of the following enzymes in infl ammatory cells?**
   a) Lipoxygenase
   b) Myeloperoxidase
   c) Phospholipase A2
   d) Phospholipase C
5. **A 4-year-old boy falls on a rusty nail and punctures his skin. The wound is cleaned and covered with sterile gauze. Which of the following is the initial event in the healing process?**
   a) Accumulation of acute inflammatory cells
   b) Deposition of proteoglycans and collagen
   c) Differentiation and migration of myofibroblasts
   d) Formation of a fibrin clot
6. **A 10-year-old boy trips at school and scrapes the palms of his hands. The wounds are cleaned and covered with sterile gauze. Which of the following terms best characterizes the healing of these superfi cial abrasions?**
   a) Fibrosis
   b) Granulation tissue
   c) Primary intention
   d) Regeneration
7. **During the physical examination of a 22-year-old man, a purified protein derivative isolated from Mycobacterium tuberculosis is injected into the skin. Three days later, the injection site appears raised and indurated. Which of the following glycoproteins was directly involved in antigen presentation during the initiation phase of delayed hypersensitivity in this patient?**
   a) CD4
   b) CD8
   c) Class I HLA molecules
   d) Class II HLA molecules
8. **A neonate develops spastic contractions on the second postpartum day. Laboratory studies show hypocalcemia. MRI studies demonstrate aplasia of the thymus and parathyroid glands. What is the appropriate diagnosis?**
   a) Adenosine deaminase deficiency
   b) Common variable immunodefi ciency
   c) DiGeorge syndrome
   d) Transient hypogammaglobulinemia of infancy
9. **A 4-year-old child was born at term, without any congenital anomalies. She is now only 75% of normal body weight. On examination she shows dependent edema of the lower extremities as well as an enlarged abdomen. Her desquamating skin shows irregular areas of depigmentation, and hyperpigmentation. Which of the following nutritional problems is most likely present in this child?**
   a) Marasmus
   b) Scurvy
   c) Niacin deficiency
   d) Kwashiorkor
10. **A 39-year-old woman has been on and off diets for the past 10 years trying to lose weight. She has had no major illnesses during this time. Her BMI has ranged from 25 to 31 over that time. Which of the following problems is her pattern of dieting most likely to cause?**
   a) Vitamin deficiencies
   b) Increased risk for osteoporosis
   c) Greater weight gain
   d) Anorexia nervosa

Section-B

Q1. 28 years vegetarian female presenting with severe macrocytic anemia with moderate splenomegaly. Blood investigations were as follows. **(20)**
Hb-5.6 gm%, MCV – 124 FL, Platelets count 80000/cumm mm Vit B_{12} – 56 pg/ml, GBP shows hypersegmented neutrophils.

a) What is your diagnosis?
b) What is the pathogenesis of disease?
c) What are the possible complications?
d) Draw the blood picture of above case.

Q2. Write short notes on: **(4x5)**

(a) Hemophilia 2
(b) Pathophysiology of β thalassemia
(c) Immune thrombocytopenia 2
(d) Philadelphia chromosome 2

Q3. Multiple Choice Questions: **(10x1)**

1. **Which ONE of these statements is TRUE regarding normal adult bone marrow?**
   a) It is composed of 90% haemopoietic cells, 10% fat
   b) It has a myeloid : erythroid ratio of 1 : 2
   c) It is present in adults in the skull
   d) It secretes erythropoietin
2. **Which ONE of these is NOT TRUE concerning the haemopoietic stem cell?**
   a) It is believed to represent approximately 1% of bone marrow cells
   b) It is thought to have a $CD34^{+}CD38^{-}$ phenotype
   c) It resembles a small to medium sized lymphocyte
   d) It is effectively transferred during stem cell transplantation
3. **Which ONE of the following is NOT a significant component of bone marrow stroma?**
   a) Endothelial cells
   b) Adipocytes
   c) Fibroblasts
   d) Epithelial cells
4. **Which ONE of these is NOT a mechanism by which granulocyte colony-stimulating factor (G-CSF) can increase neutrophil production?**
   a) Increased differentiation from progenitor cells
   b) Reduction in the self-renewal of haemopoietic stem cells
   c) Increased rate of maturation of immature myeloid cells
   d) Suppression of apoptosis of myeloid cells
5. **Which ONE of these cytokines has an important role in normal early haemopoiesis?**
   a) IL-1
   b) IL-2
   c) IL-3
   d) IL-6
6. **Which ONE of these is NOT TRUE concerning the normal cell cycle?**
   a) DNA is replicated in G_1 phase
   b) The cycle is divided into the M phase and the interphase
   c) Cyclin dependent protein kinases (Cdk) phophorylate protein targets
   d) Cyclin proteins are synthesized and degraded during the cell cycle

7. **A 33-year-old woman has experienced low grade fevers, night sweats, and generalized malaise for the past 2 months. On physical examination she has non-tender cervical and supraclavicular lymphadenopathy. A cervical lymph node biopsy is performed. On microscopic examination at high magnification there are occasional CD15+ and CD30+ Reed-Sternberg cells along with large and small lymphocytes and bands of fibrosis. Which of the following is the most likely diagnosis?**
   a) Burkitt lymphoma
   b) Hodgkin lymphoma
   c) Multiple myeloma
   d) Cat scratch disease
8. **A 30-year-old man has had a sore throat with fever for 5 days. On physical examination he has mildly tender generalized cervical lymphadenopathy. Laboratory findings include Hgb 13 g/dL, platelet count 277,000/microliter, and WBC count 12,670/microliter with differential count of 75 segs, 10 bands, and 15 lymphs Which of the following is the most likely diagnosis?**
   a) Lymphocytic lymphoma
   b) Hodgkin lymphoma
   c) Group A *Streptococcus* infection
   d) Brucellosis
9. **Eosinophilia seen in**
   a) Tubercular lymphedinitis
   b) Diabetic Nephropathy
   c) Bronchial asthma
   d) Lobar pnemonia
10. **A 16-year-old boy has had a low energy level for as long as he can remember. On physical examination he has a palpable spleen tip. A CBC shows Hgb of 8.8 g/dL, Hct 24.1%, MCV 65 fL, platelet count 187,000/microliter, and WBC count 7400/microliter. His serum ferritin is 3740 ng/mL. A bone marrow biopsy is performed and on microscopic examination reveals a myeloid:erythroid ratio of 1:4, and there is 4+ stainable iron. Which of the following is the most likely diagnosis?**
    a) G6PD deficiency
    b) Beta-thalassemia
    c) Sickle cell anemia
    d) Hereditary Spherocytosis

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