Q.P. Code :20772

[Time: 2:30 Hours] **[Marks:75]**

Please check whether you have got the right question paper.

N.B:
1. All the questions are compulsory. Choice is internal.
2. Figures to the right indicate full marks.
3. All questions carry equal marks.
4. Draw flow charts / diagrams wherever necessary.

Q.1 A) Choose the **MOST APPROPRIATE** option : (**any three**) 03

i) Chemical barriers include ----------
   a) Tears, breast milk, sweat, saliva, stomach acid and faeces
   b) Hair, breast milk, sweet, saliva, stomach acid.
   c) Tears, breast milk, sweat, saliva, stomach acid.

ii) Macrophages are derived from ----------.
   a) neutrophils
   b) lymphocytes
   c) monocytes

iii) Phagocytosis is **not** mediated by ----------.
   a) kupffer cells
   b) T cells
   c) macrophages

iv) Active immunity is obtained through injecting ----------.
   a) antibiotics
   b) antigens
   c) antibodies

v) ---------- immunity convey the longest lasting immunity to an infectious agent.
   a) Naturally acquired passive
   b) Artificially acquired passive
   c) Naturally acquired active

vi) ---------- are most effective at destroying intracellular pathogens.
   a) T helper cells
   b) B cells
   c) T cytotoxic cells

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B) Define and explain **any one** of the following: 02
   i) M cell
   ii) Opsonization

C) Write a short note on **any one**: 04
   i) Primary lymphoid organs
   ii) Cytokines

D) Answer **any one of** the following: 06
   i) Compare and contrast – cell mediated immunity and humoral immunity.
   ii) Discuss the various cells involved in immune system.

Q.2 A) Choose the **MOST APPROPRIATE** option : (**any three**) 03

i) ---------- is **not True** about antibody structure.
   a) Antibodies are built from equal numbers of large (heavy) and small (light) peptide chains.
   b) All antibodies are secreted and function away from the cell and they are not attached to the cell membrane.
   c) The class of the antibody molecule is determined solely by its heavy chain.

ii) The antibody which is found in secretions is ----------.
   a) IgD
   b) IgE
   c) IgA

iii) Light chains can be ----------.
   a) $a\ and\ \lambda$
   b) $a\ and\ k$
   c) $k\ and\ \lambda$

iv) Within the antigen binding region ---------- shows maximum variability.
   a) hinge region
   b) framework region
   c) complementarity determining region

v) Proper hinge region is not present in ---------- antibody.
   a) IgD
   b) IgM
   c) IgG

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vi) Reagenic antibody has ---------- heavy chain.
- a) delta
- b) mu
- c) epsilon

B) Define and explain **any one** of the following: 02
- i) $F(ab)_2$
- ii) Immunogen

C) Write a short note on **any one** of the following: 04
- i) Factors affecting immunogenicity
- ii) Types of chains present in antibodies

D) Answer **any one of** the following: 06
- i) Elaborate on VJ rearrangement in an antibody molecule
- ii) Discuss the fine structure of an antibody molecule

Q.3 A) Choose the **MOST APPROPRIATE** option : (**any three**) 03

i) The oxidation state of iron in Ferritin is ----------.
- a) +2
- b) +3
- c) +1

ii) $a_2\gamma_2$ is the subunit composition of ----------.
- a) Hb A
- b) Hb A_2
- c) Hb F

iii) Embolism is a ----------.
- a) fatty streak that increases elasticity of blood vessels.
- b) localized blood clot
- c) clot that travels in blood

iv) Gene involved in Tay Sach's is present on chromosome number ----------.
- a) 11
- b) 15
- c) 17

v) Sickle cell anemia is the clinical manifestation of homozygous genes for an abnormal Hb molecule. The mutational event responsible for is ----------.
- a) deletion
- b) insertion
- c) point Mutation

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vi) Spinach is not a good source of Iron because ----------.
- a) iron is the inorganic form
- b) it has high amount of oxalates
- c) iron is an the organic form

B) Define and explain **any one** of the following: 02
- i) Archibiald Garrod
- ii) Arterioseclerosis

C) Answer the following: (**any one)** 04
- i) Explain the etiology and clinical manifestation of an inborn error of carbohydrate metabolism.
- ii) Discuss the biochemical reason and pathophysiology of sickle cell anaemia.

D) Answer the following: (**any one)** 06
- i) In detail elaborate on an inborn – error of lipid metabolism, under the following headings:
  - a) Etiology
  - b) Pathophysiology
  - c) Signs and symptoms
- ii) Discuss in detail the sequence of events that lead to the progression of atherosclerosis.

Q.4 A) Choose the **MOST APPROPRIATE** option : (**any three**) 03

i) 32 – Year old woman has been diagnosed with a lump in her breast. Her aunt also suffers from breast cancer. Given this presentation, the patient is suspected to have a mutation in which gene?
- a) Ras
- b) BRCAI
- c) bcl

ii) Cancer of nervous tissue is known as ----------.
- a) sarcoma
- b) glioma
- c) leukemia

iii) ----------cancer in humans is directly caused by a viral infection.
- a) Acute T cell leukemia
- b) Burkitt's lymphoma
- c) Rous sarcoma

iv) ---------- is a purine analog used in cancer therapy .
- a) 6 – Mercuropyrimidine
- a) 6 – Mercaptoppurine

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b) 6 – Methyl – 3 – purine

v) Doctor says Skoog suffers from sarcoma. To the common man, Skoog suffers from cancer of ----------.
   a) epithelial
   b) bone
   c) cartilage

vi) Cancer is caused due to ----------
   a) controlled mitosis
   b) uncontrolled mitosis
   c) uncontrolled meiosis

B) Define and explain **any one** of the following: 02
   i) Metastasis
   ii) Carcinogen

C) Answer the following: (**any one)** 04
   i) Citing examples, explain physical and biological agents of cancer.
   ii) Discuss the morphological and biochemical characters of cancer cells.

D) Answer the following: (**any one)** 06
   i) Elaborate on a test to determine the mutagenicity of a chemical.
   ii) Write a detailed elaborative note on cancer therapy, with special emphasis on the use of chemotherapeutic drugs.

Q.5 A) Answer **any one** : 03
   i) Give the biological function / s of: complement system; phagolysozome; spleen.
   ii) Write a note on innate immunity.

B) Answer **any one** : 03
   i) Write in brief about monoclonal antibodies.
   ii) Describe the effect of papain and mercaptoethanol on an antibody molecule.

C) Answer the following : (**Any one**) 03
   i) Briefly explain the etiology and types of albinism.
   ii) Justify: “Thalassemia is caused due to defect in globin chains”.

D) Answer the following: (**Any one**) 03
   i) Justify: “Cancer results because of defect in genes”.
   ii) State true or false, giving reason: “All cellular growths are cancerous”.

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03

E) Answer the following : (**Any one**)

i) All immunogens are antigens

ii) Molecular weight of a heavy chain is close to 50kD.

iii) Clonal selection of cells involved in adaptive immunity is a way to ensure specificity.

iv) Monoclonal antibodies are largely being used for cancer therapy.

v) All carcinogens are mutagens.

vi) Most in born errors of metabolism results due to autosomal dominant character.
