Q.P. Code :20774

[Time: Three Hours] **[Marks:80]**

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 flowcharts / diagrams. Wherever necessary.

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

i) The physical barriers that form part of the immune system are ----------.
   a) skin and all membranes
   b) skin, body temperature and the peritoneal membranes
   c) skin, body temperature and the mucosal membrane

ii) Neutrophils, eosinophils and basophils are known as ----------.
   a) granulocytes
   b) non – granulocytes
   c) lymphocytes

iii) Innate immunity is provided by ----------.
   a) Phagocytes
   b) T – lymphocytes
   c) B- lymphocytes

iv) Inflammation reaction is brought about by ----------.
   a) plasma cells
   b) mast cells
   c) macrophages

v) Memory cells are formed from ----------.
   a) erythropoietic stem cells
   b) monocytes
   c) B – lymphocytes

vi) Passive immunity is obtained through injecting ----------.
   a) antibiotics
   b) antigens
   c) antibodies

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B) Define and explain **any one** of the following : 02
   i) PALS
   ii) Opsonin

C) Write a short note on **any one:** 04
   i) Phagocytosis
   ii) Lymph node

D) Justify **any one** of the following: 06
   i) Cytokines are chemical messengers mediating immune functions
   ii) Cell mediated and humoral immunity are both mediated by T_H cells.

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

i) ---------- has the highest avidity of the immunoglobulins.
   a) IgA
   b) IgM
   c) IgG

ii) ---------- mediates type I hypersensitivity reaction.
   a) IgE
   b) IgG
   c) IgA

iii) Which is not a function of IgG?
   a) Major antibody in serum
   b) First antibody type produced against an antigen during the primary antibody response
   c) Activates or fixes complement.

iv) ---------- is / are present in IgM
   a) Hinge region
   b) J chain
   c) Only 2 fab

v) Heavy chains can be ----------.
   a) $a\ and\ \delta$
   b) $a\ and\ \lambda$
   c) $\delta\ and\ k$

vi) Within the antigen binding region ---------- shows lesser variability.
   a) hypervarible region
   b) framework region
   c) complementary determining region

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B) Define and explain **any one** of the following: 02
   i) Fab
   ii) Hapten

C) Attempt **any one** : 04
   i) Write a short note on Monoclonal antibodies
   ii) Justify : Antibodies are of more than one type

D) Answer **any one** of the following: 06
   i) Elaborate on VDJ rearrangement in an antibody molecule
   ii) Discuss the detailed structure of an antibody molecule.

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

i) The metal ion involved in atherosclerosis is ----------.
   a) Ca^{+2}
   b) Fe^{+2}
   c) Fe^{+3}

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

iii) $\alpha_2\delta_2$ is the subunit composition of ----------.
   a) Hb A
   b) Hb A_2
   c) Hb F

iv) Atheroma is ----------.
   a) a fatty streak that increases elasticity of blood vessels
   b) a localized blood clot
   c) fat deposition that decreases elasticity of blood vessels.

v) Gene involved in Von Gierke's is present on chromosome number ----------.
   a) 13
   b) 15
   c) 17

vi) _____disease is caused because of defective lysosomal enzyme
   a) Von Gierke's
   b) Tay Sach's
   c) Albinism

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B) Define and explain **any one** of the following: 02
   i) Father of Biochemical genetics
   ii) Haemoglobinopathy

C) Answer the following : **(any one**) 04
   i) Explain the etiology and clinical manifestation of an inborn error of protein metabolism.
   ii) Discuss the underlying biochemistry and types of thalassemia .

D) Answer the following : (**any one**) 06
   i) In detail elaborate on an inborn – error of carbohydrate metabolism, under the following headings :
      1) Etiology
      2) Pathophysiology
      3) 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) ---------- is NOT a characteristic of cancerous cells
      a) Increased synthesis of DNA and RNA
      b) Have rounded shape
      c) Unaltered Nuclear : cytoplasmic ratio

   ii) Cancer of epithelial cells is known as ----------.
      a) sarcoma
      b) glioma
      c) leukemia

   iii) P 53 is a ----------.
      a) tumor suppressor genes
      b) oncogenes
      c) protoncogenes

   iv) ---------- cancers do not form a solid mass.
      a) lymphoma
      b) carcinoma
      c) sarcoma

   v) The philadephia chromosome is associated with ----------cancer.
      a) lymphoma
      b) leukemia
      c) myeloma

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vi) BRCA – 1 is associated with ---------- cancer.
a) breast
b) thyroid
c) nerve

B) Define and explain **any one** of the following: 02
i) Neoplasm
ii) Angiogenesis

C) Attempt **any one** : 04
i) Justify: " Carcinogens exhibit diversity".
ii) Discuss the physiology of cancer cells.

D) Answer the following : (**any one**) 06
i) Elaborate on the contribution of Ames to the field of cancer biology.
ii) Discuss in detail the different treatment modalities available for cancer therapy.

Q.5 A) Answer **any one** : 03
i) Give the biological function / (s) of : Iron binding proteins; Lysozymes; Paneth cells
ii) Differentiate between Innate and Adaptive Immunity.

B) Attempt **any one**: 03
i) In short, explain factors affecting immunogenicity.
ii) In relation to an antibody, describe the significance of sulfhydryl bond and hinge region.

C) Answer the following : (**any one**) 03
i) Briefly explain a disorder caused due to deficiency of iron.
ii) Justify: "Sickle cell anaemia is caused due to a point mutation".

D) Answer the following : (**any one**)
i) In short, explain the significance of tumour suppressor gene, oncogenes and protoncoges in cancer progression. 03
ii) Differentiate between benign and malignant tumor.

E) State true or False **any one** : 03
i) All antigens are immunogens.
ii) Molecular weight of a heavy chain is close to 150kD.
iii) Clonal selection of cell involved in innate immunity is a way to ensure specificity.
iv) Polyclonal antibodies are carcinogens.
v) All mutagens are carcinogens.
vi) Most in born errors of metabolism results due to autosomal recessive characters.