2016

BIOTECHNOLOGY

PAPER : BIT 201

IMMUNOLOGY

Full Mark : 80

Time : 3 Hrs

Figures in the right hand margin indicate full marks for the question

1 Answer the following questions (any eight). $8 \times 1 = 8$

a) Antibody titer refers to the

i) Absolute amount of specific antibody

ii) Concentration of specific antibody

iii) Highest dilution of antibody still able to give a positive result in a test system

iv) Affinity of specific antibody

b) Ig idiotypes are found_____

i) In the constant region of the heavy chain

ii) In the constant region of the light chain

iii) In the hinge region

iv) In the variable region of both heavy and light chains

c) The intermolecular forces which contribute to the interaction between antibody and antigen

i) Are all electrostatic

ii) Are all van der Waals.

iii) Are all hydrophobic

iv) Are all hydrogen bonds.

v) Rely on a combination of the above

d) The classical and alternative pathways meet at complement component

i) C4 ii) C4b

iii) Factor D iv) C3

e) HIV binds to

i) CD4 ii) NF kappa B

iii) Reverse transcriptase iv) TNF receptors

f) Which of the following statements does not apply to IgG?:

i) Appears early in the primary immune response.

ii) Neutralizes bacterial toxins

iii) Can fix complement

iv) Crosses the human placenta

g) A graft between members of the same species is termed an

i) Allograft ii) Xenograft

iii) Isograft iv) Autograft

h) A hapten is

i) An epitope. ii) A paratope. iii) A carrier

iv) A small chemical grouping which reacts with preformed antibodiy

i) TCR recognition of peptide-MHC class II depends on

i) Covalent binding. ii) CDR-mediated binding

iii) A minimum of 2 peptides occupying the binding groove of each MHC molecule

iv) The presence of beta2 microglobulin

j) A plasma cell secretes

i) Lysozyme

ii) Antibody of a single specificity related to that on the surface of the parent B-cell

iii) Many different types of antibody

iv) The antigen it recognizes

2. Distinguish between (any six) $6 \times 2 = 12$

a) CD4 and CD8

b) TCR and BCR

c) Active and Passive Immunity

d) Monocytes & Kupffer Cell

e) T-Cell Receptor & B-Cell Receptor

f) Antigen & Hapten

g) Tumour Specific Antigen and Tumour Associated Antigen

3. Write short notes on (any four) $4 \times 5 = 20$

a) Tuberculosis

b) Affinity

c) Antigen-Antibody Interaction

d) Antigen Processing

e) Hypersensitivity

f) Opsonization

4. Answer (any two).

a) What are cytokines? Briefly describe the family of cytokines with function. Write a note on the mechanism of action of cytokines. 2+2+4 = 8

b) What is immunodeficiency? Describe primary & secondary immunodeficiency diseases with suitable example. 2+6 = 8

c) What are tumour antigens? How tumour cell can be distinguished from normal cells? Mention the antigens which are associated with Gastro-Intestinal derived tumour and hepatomas. Describe the mechanism by which tumour escape rejection by immune system. 1+1+1+5 = 8

d) Describe the process of recognition of self and non-self antigen. 8

5. Answer (any two) 12×2 = 24

a) What is antigen presentation? What are the different type of antigen presentation done by Antigen Presenting Cell and write a note on the mechanism of processing? How self and non self antigen are distinguished by immune system of the host with suitable diagram? 2+2+2+4+2 = 12

b) What is allelic exclusion? Describe the detail about the antibody diversity formation with labeled diagram. 2+10 = 12

c) What is immunodeficiency? Describe elaborately

primary and secondary immunodeficiency with labeled diagram. Write a note on the treatment of immunodeficiency. 2+4+6=12

d) What is meant by transplantation? What are the different type of transplantation with respect to the nature of donor and the recipient? What is the major problem which is associated with graft transplantation? Describe the mechanism of rejection of graft. Write a brief note on ABO antigen.

2+4+2+2+2 = 12

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