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S. No. of Question Paper : 920

Unique Paper Code : 249505

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Name of the Paper : BCHT—510 : Immunology I

Name of the Course : B.Sc. (Hons.)/Bio-Chemistry

Semester : V

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt 5 questions in all.

Question No. 1 is compulsory.

1. (a) Indicate whether each of the following statements are true or false :

- (i) Transfer of antibodies to an individual generates active immunity.
- (ii) Haptens are immunogens.
- (iii) All lymphoid cells express antigen specific receptors on their membranes.
- (iv) Both innate and adaptive immune responses are activated at sites of infection.
- (v) Antigen presenting cells express both class I and class II MHC molecules on their membranes.
- (vi) Monoclonal antibodies can precipitate polysaccharide antigens effectively but not protein antigens.
- (vii) Immunoglobulin M is a marker for mature B cells.
- (viii) The biological activity of complement system affect only adaptive immunity.
- (ix) UV killed viral preparation will not activate Tc cells.

1×9=9

P.T.O.

(b) Explain why ?

- (i) Human skin is resistant to colonization by E.coli despite constant exposure to it.
- (ii) During blood transfusion MHC compatibility is not checked.
- (iii) A deficiency of C3 has more severe clinical manifestations than a deficiency in C1 protein.
- (iv) Dendritic cells are the most potent antigen presenting cells.
- (v) CDR3-third hypervariable region is more variable than the other two CDR1 and CDR2 regions. 5×2=10

2. (i) How are the resting Tc cells activated into cytotoxic T lymphocytes ? Explain the destruction of target cells by CTLs. 8
- (ii) Explain the biological consequences of complement activation. 4
- (iii) What is the role of secretory component associated with sIgA ? 2
3. (i) Innate and adaptive immunity act in co-operative and interdependent manner to protect the host from invading pathogens. Discuss the role of different cells and effector molecules involved in collaboration of these two types of immunity in generation of effective immune response against that particular pathogen. 8
- (ii) What are superantigens ? How do they influence T cell activation and T cell maturation ? 4
- (iii) Where are the most of the polymorphic aminoacids located in MHC molecules ? What is the significance of this location ? 2

4. (i) Explain the mechanism of formation of MAC of complement system mediated by classical pathway. 6
- (ii) Write the factors contributing to the immunogenicity of an antigen. 4
- (iii) Draw a well labelled diagram of lymph node. 4
5. (i) Mention the pathways responsible for antigen processing and presentation by target cells to T cells and explain any *one* pathway. 6
- (ii) Explain the effector functions mediated by antibodies. 4
- (iii) Differentiate between B cell epitopes and T cell epitopes. 4
6. (i) Discuss briefly the mechanisms by which antibody diversity is brought about in B lymphocytes. 6
- (ii) Describe the antigen independent phase of B cell development highlighting the role of stromal cells and the characteristics of the major stages of development. 4
- (iii) Explain the following :
PAMP, MALT, ADCC, TAP, MLR, PRR, CDRs, APR 4
7. Write short notes on (any *four*) :
- (i) Thymic education
- (ii) Adjuvants
- (iii) Toll like receptors
- (iv) Mucosa associated lymphoid tissue
- (v) Inflammation. 3.5×4=14

8. Differentiate between (any *four*) :

- (i) Natural killer cells and cytotoxic T cells
- (ii) Pre BCR and pre TCR
- (iii) Thymus dependent and Thymus independent antigens
- (iv) Primary and secondary immune response
- (v) Active immunity and passive immunity.

3.5×4=14