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**BP 605 T**

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**B.Pharm. 6<sup>th</sup> Semester End-Term Examination**

**PHARMACEUTICAL BIOTECHNOLOGY (THEORY)**

Full Marks – 75

Time – Three hours

The figures in the margin indicate full marks for the questions.

- I. Answer the following (MCQ) (20 × 1 = 20)
- (i) Who first coined the term biotechnology?
- (a) Karl Ereky (b) Antony van Locuwenkoek  
(c) Nichola Appert (d) Charles B Astier
- (ii) Development of biotechnology can be studied in how many phases?
- (a) One (b) Two  
(c) Three (d) Four
- (iii) Pathogenicity test was developed by the scientist
- (a) Louis pasteur (b) Robert Koch  
(c) Hans Buchner (d) Martin Hahn
- (iv) Which is/are the product(s) of recombinant DNA technology?
- (a) Enzymes (b) Mycoproteins  
(c) Hydrogen (d) Alcohols
- (v) Which of the following systems protects our body against disease-causing microbes?
- (a) Immune system (b) Digestive system  
(c) Excretory system (d) Respiratory system

[Turn over

- (vi) Neutrophils, basophil, lymphocytes, eosinophil and monocytes are examples of\_\_\_\_\_.
- (a) Physical barrier (b) Cellular barriers  
(c) Cytokine barriers (d) Physiological barriers
- (vii) B-cells and T-cells are two types of cells involved in \_\_\_\_\_.
- (a) Innate Immunity (b) Active immunity  
(c) Passive immunity (d) Acquired immunity
- (viii) The branch of biology involved in the study of immune systems in all organisms is called \_\_\_\_\_.
- (a) Botany (b) Microbiology  
(c) Immunology (d) Biotechnology
- (ix) Which of the following does not act as a protective barrier, for the body surface?
- (a) Skin (b) Mucus  
(c) Gastric acid (d) Salivary amylase
- (x) Hepatitis is an example of \_\_\_\_\_.
- (a) Subunit Vaccine (b) Killer Vaccine  
(c) Toxoids Vaccine (d) Recombinant Vaccine
- (xi) Interferons are \_\_\_\_\_.
- (a) Cytokine barriers (b) Physical barriers  
(c) Cellular barriers (d) Physiological barriers
- (xii) Synthesis of antibodies takes place by which of the following cells?
- (a) B-cells (b) T-cells  
(c) Bone marrow cells (d) Lymph
- (xiii) Name the heavy chain of immunoglobulin G.
- (a)  $\mu$  (b)  $\epsilon$   
(c)  $\alpha$  (d)  $\gamma$
- (xiv) Which immunoglobulin can pass through placenta?
- (a) IgD (b) IgE  
(c) IgM (d) IgG

- (xv) What is the name of MHC in humans?
- (a) HLA (b) H<sub>2</sub>  
(c) Adjuvants (d) Haplotype
- (xvi) Which of the following are the main mediators/initiators of type II hypersensitivity reactions?
- (a) Antibodies (b) Mast cells  
(c) Erythrocytes (d) Histamines
- (xvii) Monoclonal antibodies are
- (a) Heterogenous antibodies produced from single clone of plasma cells  
(b) Homogenous antibodies produced from single clone of plasma cells  
(c) Both (a) and (b)  
(d) None of these
- (xviii) Hybridoma technology was developed by
- (a) Kobler and Milstein (b) Khorana and Nirenberg  
(c) Khorana and Korenberg (d) Beedle and Tautum
- (xix) Which is working principle of ELISA?
- (a) Ag-Ab neturalization (b) Ag-Ab complex  
(c) (a) and (b) (d) None of the above
- (xx) Which one of the followings is not the type of gene mutation:
- (a) Point mutation (b) Substitution  
(c) Translocation (d) Deletion

2. Answer any seven questions (7 × 5 = 35)

- (a) Discuss the methods of production of citric acid with a schematic diagram.
- (b) Write in short about spontaneous mutation and Induced mutation. (2.5 + 2.5 = 5)
- (c) Write principle of ELISA and classify it. (3+2 = 5)
- (d) Write in detail about basic structure of Immunoglobulin.
- (e) Discuss the principle of hybridoma technology.
- (f) Write the factors affecting the storage of vaccine with its conditions
- (g) Describe the principle of biosensor.
- (h) Discuss about mutagenesis and recombinant DNA technology. (2.5+2.5 = 5)
- (i) Define cloning vector, Discuss different types of cloning vectors. (1+4 = 5)

3. Answer any two questions

(2 × 10 = 20)

- (a) Write in detail about immuno blotting techniques.
- (b) What is rDNA technology? Discuss the process of production of human insulin and vaccine. (2+4+4 = 10)
- (c) Discuss about : (2 × 5 = 10)
  - (i) Restriction endonucleases
  - (ii) DNA ligase
  - (iii) PCR
  - (iv) MHC
  - (v) Plasmid and transposons

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