

- N. B. : (1) All questions are compulsory.
 (2) Figures to the right indicate total marks.
 (3) Draw neat and labeled diagram wherever necessary.

1. (a) Give one word for the following : (any three) 3
 (i) Vesicles formed after fusion of phagosome and lysosome.
 (ii) Macrophages present in lungs.
 (iii) Non-phagocytic granulocyte.
 (iv) Secondary lymphoid organ showing presence of M cells.
 (v) Antibody present in saliva.
 (vi) Water in oil emulsion, containing antigen in aqueous phase and killed bacteria in oily phase, used to enhance immune response.

- (b) Attempt the following : (any two) 12
 (i) Discuss the role of thymus as a primary lymphoid organ.
 (ii) What are antigens? Describe its types.
 (iii) Justify: Passive immunity can be acquired naturally and artificially.
 (iv) Describe the third line of defense in innate immunity.

2. (a) Give an example of the following : (any three) 3
 (i) mIg bearing cell.
 (ii) T cell accessory molecule.
 (iii) Dimer that form part of CD3 in TCR complex.
 (iv) Technique that uses immunodiffusion and electrophoresis.
 (v) Fluorescent dye used in immunofluorescence.
 (vi) Method for immunoprecipitation.

- (b) Describe : (any two) 12
 (i) Structure of MHC Class I and II (Using diagram).
 (ii) Structure of BCR.
 (iii) Principle and applications of Immunoblotting.
 (iv) Principle of direct and indirect ELISA.

3. (a) Do as directed :
 (i) Give the biochemical reaction catalyzed by UDP-glucose pyrophosphorylase. 2

OR

- (i) Give the structure of UDP-galactose.

(ii) Name the intracellular site for the biosynthesis of sucrose.

OR

(ii) Name the enzyme for the reaction- UDP-glucose to sucrose 6 phosphate.

(b) Answer the following : (any two)

(i) Describe catalytic activity of starch synthase in detail.

(ii) Justify: "Fructose 2,6 biphosphate is a potent regulator of gluconeogenesis."

(iii) Give an overview of steps involved in peptidoglycan biosynthesis.

(iv) Elaborate on allosteric regulation of sucrose 6 phosphate synthase.

(a) Name the biochemical pathway to which the following reactions belong : (any three)

(i) β hydroxyacyl ACP to enoyl ACP.

(ii) Stearate to oleate.

(iii) Squalene to Squalene 2,3 epoxide.

(iv) DHAP to glycerol 3 phosphate.

(v) Phosphatidyl serine to phosphatidyl ethanolamine.

(vi) Mevalonate to phosphomevalonate.

(b) Attempt the following : (any two)

(i) Acetyl Co A carboxylase is a key regulatory enzyme of fatty acid biosynthesis - Justify.

(ii) Give an account of the desaturation of fatty acids catalysed by mixed function oxidases.

(iii) Discuss the synthesis of phosphatidylcholine from choline in mammals.

(iv) Describe the formation of mevalonate in cholesterol biosynthesis.

5. Write short notes on : (any three)

(i) Factors influencing innate immunity.

(ii) Classes of antibodies.

(iii) Coombs' test.

(iv) Role of glycogenin in glycogen biosynthesis.

(v) Regulation of Cholesterol biosynthesis.

(vi) Synthesis of long chain fatty acids from palmitate.