

Kalyani Mahavidyalaya
Part-I Honours Test Examination-2017
Subject: Molecular Biology & Biotechnology
Paper-I

USE SEPARATE SHEETS FOR EACH GROUP

Full marks - 50

Group A

Time – 2hrs

Marks: 25

A. Answer any five:

5*1

1. The outermost layer of a blood vessel is -----.
2. Which of the following protein is involved in clotting ---- globulins , fibrinogen, albumins.
3. The vagus nerve stimulates the sinoatrial node. T/F.
4. At the venule end of the capillary bed, osmotic pressure of the blood in the vessel is found to be greater than the blood pressure in the vessel T/F.
5. The ----- rRNA is the primary catalyst of peptide bond formation.
6. Initiation sites in prokaryotic mRNAs are characterized by ----- sequence that precedes the AUG initiation codon .
7. Name the site of nucleus at which the rRNA genes are transcribed.
8. Most of the metabolic reactions of the prokaryotic cells take place at ----- of the cell.

B. Answer any five:

5*2

1. State one difference between Cytosol and Cytoplasm?
2. Name the predominant phospholipids of the inner leaflet and the outer leaflet of the plasma membrane.
3. What is pinocytosis?
4. Distinguish between Heterochromatin and Euchromatin.
5. State the function of Telomere.
6. What is Oxidative phosphorylation?
7. What is Constitutive pathway?
8. How does cell protect cytosol from any lysosomal acid hydrolases.

C. Answer any two:

5*2

1. What is the threshold potential? Describe All-or-None Principle. 2+3
2. Write the steps in the Contraction Cycle of muscle. 5
3. What is the facultative Reabsorption of water? State the function of juxtamedullary nephrons. Name the major substances reabsorbed from nephron. 3+1+1
4. Myofibrils are built of 3 kinds of protein... mention what are those. What is Saltatory conduction? 3+2

(A) Answer any five**5*1=5**

- (i) Name two hormones derived from tyrosine.
- (ii) Pancreatic α and β -cells produce the hormones _____ & _____ respectively.
- (iii) Hypo-secretion of Antidiuretic hormone can lead to a condition called_____.
- (iv) Auto-antibodies against TSH receptor lead to _____ disease.
- (v) Sphingomyelin is a phospholipid – T/F
- (vi) Penicillin acts as a suicide inhibitor of transpeptidase enzyme – T/F
- (vii) Niemann – Pick disease is an inherited sphingolipid disorder – T/F

(B) Answer any five**5*2=10**

- (i) Between stearic acid (18:0) and cis-Oleic acid [18:1(Δ^9)], which fatty acid do you expect to have higher melting point and why? (2)
- (ii) Pictorially distinguish between micelle and liposome. What does FRAP stand for? (1.5+0.5)
- (iii) How does temperature affect the rate of enzyme catalyzed reaction? What is isozyme?(1+1)
- (iv) Enzymes do not alter the equilibrium position of a reaction – T/F. What specific advantage does Lineweaver-Burk transformation have over Michaelis Menten equation? (0.5+1.5)
- (v) Name the secretions from (a) Parietal cells, (b) Peptic cells, (c) Goblet cells. The absence of which of the above cell types might lead to pernicious anemia? (1.5+0.5)
- (vi) (a) NAD is a coenzyme derived from Vit _____. (b) Gamma carboxylation of glutamate residues in prothrombin is brought about by Vit_____ dependent enzyme system. (c) Gall bladder produces Cholecystokinin – T/F. (d) Trypsin digests protein in alkaline medium – T/F
(0.5 each)
- (vii) Name the deficiency disorder related to: (a) Protein, (b) Vit C, (c) Vit B3, (d) Vit B1(0.5each)

(C) Answer any two**2*5=10**

- (i) (a) Comment on hypothalamo-hypophysial tract and its function. (b) Give an example of a lipid soluble hormone. (c) With a simple sketch depict its mode of action at molecular level.
(2+1+2)
- (ii) (a) If the substrate concentration [S] in an enzyme catalyzed reaction is equal to $\frac{1}{2} K_m$, express the initial velocity (V_o) in terms of V_{max} . (b) Express the [S] in terms of K_m when the initial velocity (V_o) of an enzyme catalyzed reaction is 25% of V_{max} . (2.5+2.5)
- (iii) (a) Bile is the main exocrine secretion of _____. (b) Comment on the nature and function of bile salts. (c) Name two bile pigments. (1+2+2)
- (iv) (a) Lower value of K_m indicates greater affinity of enzyme for substrate – T/F. (b) Distinguish between Competitive, Non competitive and Uncompetitive inhibition w.r.t only K_m and V_{max} . How does reaction velocity curve of an allosteric enzyme differ from that of Michaelis-Menten enzyme? (1+2+2)