

Time 1 hr

1. Write a short note on: (Any three) 3x2=6

a) Laminin

~~b) Fibronectin~~

~~c) Anterograde and retrograde Transport~~

d) Molecular Motors

~~e) Cadherin~~

2. Describe the molecular mechanism of (Draw schematic wherever applicable) (2x3=6)

~~a) Muscle contraction~~

~~b) Nuclear transport~~

3. Platelets are flat, disc like cells about 2µm in diameter. If the average Integrin molecules are about 10 nm in diameter, how tightly packed are they in terms of number of Integrins on an average platelet membrane? Consider the area of a platelet approximated as the areas of two circles. (3)

4. Fill in the Blanks. (Any five) 5x1=5

i. Unfolding of kinesin into its active conformation is promoted by

ii. and constitute a calcium dependent switch that activates contraction in both skeletal and cardiac muscle.

iii. The motor domains of Kinesins contain both and binding motifs.

iv. The increase in sarcolemmal regulates muscle contraction.

v. Migratory cells attach to ECM molecules via focal adhesion (As P1)

vi. Smooth muscles do not contain a line. Retrograde

vii. transport moves endogenous material down the axon and transport returns exogenous material into the cell body.

5. Give one word answers to the following. (any 5) (5)

i. A weak competitive inhibitor of both myosin and dynein. *Arp1*

ii. Regulator of the association and dissociation of a karyopherin-cargo complex. *any protein*

iii. Transport receptors at the Nuclear Pore Complex (NPC). *Collagen*

iv. Major protein of ECM having rigid triple helix of three intertwined polypeptide chains. *any protein*

v. Carbohydrate binding protein that promotes cell-cell adhesion. *any protein*

vi. Matrix in which Collagen and elastins proteins are embedded. *any protein*

vii. Humans genetic disease conferring inability to synthesize β₂ Integrins.

viii. Repeating units between two Z-discs in a myofibril.

any protein
any protein
any protein

10-17
10-18
10-19