RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

SECOND YEAR [2017-20]

B.A./B.Sc. THIRD SEMESTER (July – December) 2018

Mid-Semester Examination, September 2018

Date : 24/09/2018

MICROBIOLOGY (Honours)

Time : 11 am – 1 pm

Paper : III

Full Marks : 50

1. a) Explain the nature and importance of signal sequences during transport of secretory proteins. [2+2]
   b) Define 'Phagocytosis' and 'Pinocytosis' with proper example. [3]

2. a) What are the advantages and disadvantages of lineweaver-Burke plot over Michaelis-Menten plot? [3]
   b) Why is Michaelis – Menten cosntant (km) important ? [2]

3. a) What are the extracellular receptors ? [2]
   b) Write down the stimulatory role of 'G' protein. [2]
   c) Compare in between autocrine and paracrine signalling. [2]
   d) Give one example of secondary messenger involved in cell signalling. [1]

4. a) Do you think that air is suitable for growth of microorganisms ? [2]
   b) Write down the differences between droplet proper and droplet nuclei [3]
   c) What is the reason behind false positive result during coliform test of water ? [3]

5. a) How does RNA Polymerase of bacteria do their catalytic function? [2.5]
   b) How does sigma factor mediate exact binding of polymerase to the promoter ? [2.5]
   c) What is the role of nusA protein in intrinsic termination process ? [1.5]
   d) What are constitutive promoters ? [1.5]

6. a) State the necessity of initiator methionyl RNA to be formylated. [1]
   b) Write down the mechanism of formation of —
      i) aminoacyl t RNA [2]
      ii) release of peptide from peptidyl t RNA [2]
   c) Variation in the AT/GC content in a cell may not be reflected in the variation of polypeptides in the cell. Why ? [3]

7. a) State with examples the varieties of bacterial transport pathways that are present in *E.coli*. [2]
   b) Calculate the ΔG for the hydrolysis of ATP at pH 7.0 and $37^{o}C$ under steady-state conditions (such as might exist in living cells) in which the concentrations of ATP, ADP and P_i are maintained at 1.0 mM, 0.10 mM and 10 mM, respectively. [2]
   c) Write a brief account on ion channels. [3]

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