

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

FIRST YEAR [2017-20]

B.A. /B.Sc. SECOND SEMESTER (January – June) 2018

Mid-Semester Examination, March 2018

Date : 14/03/2018

MICROBIOLOGY (Honours)

Time : 11am – 1pm

Paper: II

Full Marks: 50

Answer the following questions:

1. a) Which step in the Avery, McLeod and McCarty's experiment was crucial to conclude that DNA is the genetic material? (2)
b) How was it proved that RNA is the genetic material of TMV? (3)
2. a) Why might a culture have a long lag phase after inoculation? Why would cells that are vigorously growing when inoculated into fresh culture medium have a shorter lag phase than those that have been stored in a refrigerator? (1 + 2)
b) Define synchronous culture and continuous culture. (1 + 1)
c) Why do shift-up and shift-down experiments cause cells to enter unbalanced growth? (2)
3. a) Membrane lipids are asymmetrically oriented – elaborate with example. (1½)
b) Explain the term phase transition temperature. (1½)
c) Write a brief account on glycophorin – a membrane spanning protein. (2)
4. a) How does population density influence activity of antimicrobial agents? (2)
b) What is Berkefeld filter? (2)
c) Why are anaerobic bacteria susceptible to metronidazole? (2)
5. a) Define specific activity and relative activity of a radioactive substance. (1 + 1)
b) What is half life of a radioactive substance? Deduce an expression to relate between half life and decay constant. (1 + 2)
6. a) Mitochondria are called 'semi-autonomous' organelle—explain. (2)
b) Write down the similarities between mitochondria and prokaryotes (2)
c) What is thylakoid? (1)
7. a) In context to lipids, state how penguins in Antarctica live under subzero conditions ? (3)
b) Write down the structures and the IUPAC name of the following: (1 × 3)
 - i) Palmitoleic acid
 - ii) Myristic acid
 - iii) Valeric acid
8. From the following information of an agriculture area of U.P., estimate the probable crop yield when rainfall is 30 inches. Correlation coefficient(r) is 0.65

Variable	Rainfall (x)	Crop yield per unit (y)
Mean	25	40
S.D.	3	6

OR,

(5)

Calculate correlation of coefficient (r) from the following data:

X	1	3	4	5	7	8	10
Y	2	6	8	10	14	18	20

9. a) How will you prove that glucose is present in the furanose or pyranose form? (2)
- b) How will you convert glucose to glucouronic acid? (2)
- c) What happen when glucose is treated with dilute alkali (NaOH)? (2)

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