

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

FIRST YEAR [BATCH 2015-18]

B.A./B.Sc. SECOND SEMESTER (January – June) 2016

Mid-Semester Examination, March 2016

Date : 17/03/2016

MICROBIOLOGY (Honours)

Time : 11 am – 1 pm

Paper : II

Full Marks : 50

1. a) Define half life and average life of a radioactive substance. [2]
b) Mention the use of radioisotopes in medical diagnosis and treatment. [1·5+1·5]
2. a) How do polar bears stay alive in the subzero temperatures in the arctic? [4]
b) Write down the structure alongwith the IUPAC name of the following: [3×1]
i) Phosphatidylethanolamine
ii) Behenic acid
iii) Oleic acid
3. a) Write down the differences between mitochondrial DNA and chloroplast DNA. [1·5]
b) Mention the theory regarding the biogenesis of mitochondria. [1]
c) Mention any two parts one from each of mitochondria and chloroplast with one function of each. [2·5]
4. a) How can you prove that DNA replication is bidirectional? [2]
b) State the differences between topoisomerase I & II. [2]
c) What are meant by processivity and turnover number in respect of DNA replication? [2]
5. a) Define growth factor with example. [2]
b) Write down the differences between chemoorganotroph and chemolithotroph with example. [4]
c) What do you mean by selective medium? [1]
6. a) What do you mean by invert sugar? [2]
b) How will you convert glucose to glucouronic acid? [2]
c) Write short notes on Smith degradation? [2]
d) Glucose and fructose give same osazone —justify. [2]
e) How will you prove that fructose present in sucrose are in β form? [2]
7. a) If $\bar{x} = 6$, $\bar{y} = 7$, $b_{yx} = 0.45$, find the regression equation of y or x. [2]
b) Find correlation coefficient (r), if $\partial x^2 = 6.25$, $\partial y^2 = 4$, $\text{cov}(x,y) = 0.9$. [2]
c) Write the equation for the contingency chi-square. [1]

OR,

- a) Find correlation coefficient,
i) If $b_{yx} = 1.6$ and $b_{xy} = 0.4$
ii) If $b_{yx} = -0.3$ and $b_{xy} = -1.2$ [2]
- b) Find regression coefficient b_{xy} and b_{yx} if $\partial x = 4$, $\partial y = 3$ and $r = 0.8$. [2]
- c) Write the equation for the contingency chi-square. [1]
8. a) The complementary colour pairs are : violet – yellow, blue – orange, and green – red. Given a red, an orange and yellow polyene, which is most and which is least conjugated? [3]
b) State two uses each for ESR spectroscopy and γ -ray. [2]