

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

THIRD YEAR

B.A./B.SC. FIFTH SEMESTER (July – December), 2012

Mid-Semester Examination, September 2012

Date : 10/09/2012

MICROBIOLOGY (Honours)

Time : 2 pm – 4 pm

Paper : V

Full Marks : 50

1. a) Explain briefly whether the statement is true or false :
 - i) Secondary screening help in the selection of improved strain. [2]
 - ii) Regulation of pH and temperature maintain capacity is the only criterion to be a good fermenter. [2]
- b) What properties make a chemical reactor into a bioreactor? [2]
- c) Write short notes on Antifoam agent. [2]

OR

1. a) Why are some microorganisms called “industrial microorganism” not all? [2]
- b) Differentiate between primary and secondary metabolites. [2]
- c) What is the basis of preservation of microbes by Lyophilization? What are the advantages and limitations of this method? [4]
2. a) How virus can be classified according to their symmetry? [1½]
- b) Viral lipid is fully dependent on host. —Justify. [1½]
- c) Draw a typical one step growth curve of virus. [2]
- d) How will you prove that viral nucleic acid is DNA or RNA. [2]
- e) Given an example of virus with fragmented genome. [1]

3. Write short notes on : (Answer **any three**) [4×3]

- a) Clonal selection Theory
- b) ADCC
- c) Haematopoiesis
- d) Opsonization
- e) Naive T Cell
- f) MHC proteins

4. a) If two plasmids cannot be maintained in a single cell, what property is common to the plasmids? [2]
- b) Write the role of histones in compaction of genomic DNA. [3]
- c) With suitable examples show the interconvertibility of twist and writhing number. [2]
- d) How can you prove the presence of repetitive DNA in eukaryotic genome without sequencing? [2]
- e) Why did Watson-Crick choose a double helical model for the structure of DNA? [3]

OR

4. a) What is satellite DNA? [2]
- b) What is the crucial portion of the experiments done by Avery, Mcleod and McCarty to prove that DNA is the genetic material. [2]
- c) The $Cot_{1/2}$ value of T4 phage DNA is 0.5 and contains 10^5 nucleotide pairs. An unknown organism genome showed a $Cot_{1/2}$ value of 20. What is the size of the genome of this unknown organism.
- d) Briefly mention the steps to find out the fundamental units of chromatin fibre. [2]
- e) Write down the differences between B and Z-DNA. [2]

- f) An $F'(T_s)$ lac^+ plasmid has a temperature sensitive mutation in its replication system, [2]
i) What is the phenotype of an $F'(T_s)$ lac^+/lac^- cell at 42°C .
ii) An $F'(T_s)$ lac^+/lac^- gal^+ strain is grown for many generations and then plated at 42°C . Some lac^+ colonies form at 42°C . How have these formed?
5. Justify the statements : [2×3]
a) Normal flora may alter with physiological changes
b) Skin is not suitable for the growth of Gram negative bacteria
c) Capsules are virulence determinant
6. What is type IV fimbriae? How does the different portals of entry confer resistance to the entry of pathogens? [1+3]
- OR**
6. What is super infection? Write down the functions of intestinal microflora. [2+2]

