



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 1st Semester Examination, 2022-23

MCBACOR01T-MICROBIOLOGY (CC1)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.*

Question No. 1 is compulsory. Answer any four questions from the rest

- ① Answer any **four** questions: 2×4 = 8
- ✓ (a) What is meant by resolution of a microscope?
 - ✓ (b) How viroids are different from viruses? Give example.
 - (c) Name any two economic importances of algae.
 - (d) Define 'biovar'. How it is different from 'serovar'?
 - (e) What are the major objectives of bacterial taxonomy?
 - ✓ (f) How bacterial 'species' differs from the species of other higher organisms?
 - ✓ (g) State the contribution of Joseph Lister in the development of Microbiology.
- ② (a) Describe the Whittaker system of classification. 3+2+3
- (b) What is the basis of classification?
 - (c) Discuss the merits and demerits of this classification.
- ③ (a) Fungi are Chemoorganotrophs — Explain with suitable example. 3+(2+2)+1
- (b) What are ascospores and basidiospores?
 - (c) Why the mold *Penicillium* economically important?
4. (a) What are diplomonads? Give example. 2+2+2+2
- (b) Name any human disease caused by member of diplomonads. Name the pathogen.
 - (c) What is mitosome?
 - (d) State the use of cilia in ciliate protists.
- ⑤ (a) Briefly describe how dark field and phase contrast microscopes work. State their advantages over light microscope. (2+3+1)+2
- (b) State the function of (i) condenser (ii) immersion oil.

6. (a) Describe the characters of Algae. 3+2+2+1
- (b) Why Rhodophyceae group of algae are red in colour?
- (c) What are the mode of nutrition of algae and fungi?
- (d) What are the universal pigment found in algae?
7. (a) What do you mean by polyphasic approach of bacterial taxonomy? 2+2+2+2
- (b) What is evolutionary chronometer?
- (c) Define signature sequence.
- (d) What is prion?
8. (a) What are the importance of SEM? 2+2+2+2
- (b) How SEM differs from TEM?
- (c) Define Resolving Power.
- (d) Why immersion oil is used in 100X objective lens during observation under Compound Microscope?

— x —



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 1st Semester Examination, 2022-23

MCBACOR02T-MICROBIOLOGY (CC2)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.*

Answer Question No. 1 and any four questions from the rest

1. Answer any **four** questions from the following: 2×4 = 8
- (a) What is supravital staining?
 - (b) What is anaerobic glove box technique?
 - (c) Differentiate between batch and continuous culture.
 - (d) Write down the function of SASPs.
 - (e) Why G + C content is important in microbial characterization?
 - (f) Give examples of alpha and beta proteobacteria.
 - (g) What are the differences between pili and fimbriae?
2. (a) Classify bacteria according to oxygen requirement with proper example. (3+1)+2+2
- (b) What is generation time?
- (c) A bacterial culture increases from 10^3 cells to 10^9 cells in 6 hours. Calculate the generation time. 13
3. (a) Classify bacteria according to carbon, energy and electron source. 3+(1 $\frac{1}{2}$ + 1 $\frac{1}{2}$)+2
- (b) How can you control microbial growth by
- (i) Phenol and phenolics
 - (ii) Alcohol
- (c) What is oligodynamic nature of heavy metals?
4. (a) How blood agar considers as differential medium?
- (b) Write short note on cryopreservation. 2+3+3
- (c) Discuss a method of cultivation of anaerobic bacteria.
5. (a) What are the differences between chemostat and turbidostat? Explain with suitable diagram. 4+(2+2)
- (b) What do you mean by axenic culture? What are non-culturable microorganisms?

6. (a) Calculate the generation time in a growth experiment in which a medium was inoculated with 5×10^6 cells/ml of *Escherichia coli* cells, and following a 1-hr lag, grew exponentially for 5 hr, after which the population was 5.4×10^9 cells/ml. 3+(1+2)+2
- (b) What is the a_w of pure water? Why is a viable count more sensitive than a microscopic count?
- (c) Of what use is a spectrophotometer in the study of microbial growth?
7. (a) Differentiate between selective and differential media with suitable example. 2+3+(1+1+1)
- (b) What are the differences between low G + C and high G + C content bacteria?
- (c) Write down the function of the following:
- (i) O-antigen (ii) Teichoic acid (iii) Mycolic acid.
8. (a) What are the differences between archaeobacterial and eubacteria? 3+(2+2)+1
- (b) What are the main characteristic features of *Thermoplasma* and *Halobacterium*?
- (c) What is the use of *Taq* polymerase?

—x—