2021

MICROBIOLOGY — HONOURS

Paper : CC-2

Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer ***question no.*** **1** and ***any three*** questions from the rest.

1. Answer ***any ten*** questions : 2×10

(a) What is 'Thermal Death Time'?

(b) 70% alcohol is more effective than 90% for killing bacteria.— Why?

(c) State any two differences between oxygenic and anoxygenic bacteria.

(d) What is the difference between Molecular Taxonomy and Classical Taxonomy?

(e) What are evolutionary chronometers?

(f) What is endosymbiosis?

(g) Mention two limitations of phase-contrast microscopy.

(h) Discuss the effect(s) of osmotic pressure on control of microbial growth.

(i) How do you sterilize / disinfect the following :

(i) Antibiotics

(ii) Mobile phone

(iii) Inoculation loop

(iv) Meat samples.

(j) What is 'negative staining' and how it is useful to understand the microbial morphology?

(k) Differentiate between microaerophiles and facultative anaerobes.

(l) Mention one example of each of — (i) Methanogen (ii) β-proteobacteria.

(m) What are mixotrophs? Give one example.

(n) What is/are the difference(s) between a rooted and unrooted phylogenetic tree?

(o) Why Gram character of bacteria cannot be considered as universal?

2. (a) What are the major differences between purple and green sulphur bacteria?

(b) Why Bergey's Systematic Bacteriology is advantageous than Determinative Bacteriology?

(c) What are mesosomes? Discuss its function.

(d) Define Resolving Power of a microscope.— Why is staining important for microscopic observation? 2+2+(1+1)+(2+2)

3. (a) Mention one mechanism of drug resistance in bacteria.

(b) State two unique features of the group Actinobacteria. Write one economic importance of Actinobacteria.

(c) Briefly discuss the function(s) of PHAs in bacteria.

(d) What is the significance of serial dilution in pour plate method?

(e) Name one fastidious bacteria. 2+(2+1)+2+2+1

4. (a) How does prokaryotic flagella differ from eukaryotic flagella?

(b) What are the functions of the following enzymes?

(i) SOD (ii) Catalase.

(c) Discuss the antimicrobial properties of ethylene oxide.

(d) Mention the function(s) of hopanoids.

(e) Give an example of microaerophilic bacteria. 2+(1½+1½)+2+2+1

5. (a) What are methanogens?

(b) Why are halophiles considered as extremophiles?

(c) Distinguish between eubacteria and archaebacteria.

(d) A culture begins with 4000 bacteria and doubles every 20 minutes. If the population is increasing exponentially, how long will it take until there are 28000 bacteria? 2+2+3+3

6. Write short notes on : 2½×4

(a) F-plasmid

(b) Pasteurization

(c) Archaebacterial cell wall

(d) Capsule.