

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THIRD SEMESTER EXAMINATION, MARCH 2021

SECOND YEAR [BATCH 2019-22]

MICROBIOLOGY [GENERAL]

Date : 20/03/2021

Time : 11.00 am – 1.00 pm

Paper : III

Full Marks : 50

1. Answer **any ten** from the following questions : [10×1]

- a) What is negative staining? Give examples.
- b) What are the functions of mordant in case of gram staining?
- c) What is the resolving power of a microscope?
- d) Give a specific use of phase contrast microscope.
- e) Name one Gram negative rod shaped bacterium.
- f) Name one cell organelle found in both eukaryotic and prokaryotic cell.
- g) Name one bacterium having teichoic acid.
- h) Name one monotrichous bacterium.
- i) Who discover Penicillin?
- j) Who was the founder of chemotherapy?
- k) What is centerotype?
- l) What are IMViC test?
- m) In the lag phase of growth the number of bacteria remains constant. Does this mean the cells are dormant and inert? Explain.
- n) Would you expect generation time to be a constant characteristic of a bacterial species? Explain.
- o) Define selective media. Give examples.

Answer **any four** questions of the following : [4×10]

2.
 - a) What is the difference between auxochrome & chromophore group & also mention their significance in staining purpose.
 - b) Name two acid fast bacteria & mention the reason for their acid-fastness.
 - c) Write down the differences between acidic dye and basic dye with examples. [(2+2)+(2+2)+2]
3.
 - a) State the function of eyepiece and condenser in a microscope.
 - b) How are resolution and magnification related?
 - c) Mention the differences between light microscope and electron microscope.

- d) Write down the principle of dark field microscopy?
- e) Why does electron microscope have so much greater resolution than light microscope? [2+2+2+2+2]
4. How does sporulation in bacteria occur? What is spore cortex made up of? Write down its function. [4+3+3]
5. How does capsule act as virulence factor? What is basal body of flagella made up of? Why is sex pili named so? [4+3+3]
6. a) Explain Koch's postulates.
- b) What were the contributions of Louis Pasteur in Microbiology?
- c) What is dichotomous Key?
- d) Write down the principle of indole test. [4+2.5+1+2.5]
7. a) Write the major differences between Archaeobacterial cell membrane structure and Eubacterial cell membrane structure.
- b) What are seroverters?
- c) What is oligonucleotide signature sequence? Give example.
- d) Compare the common characteristic features between three domain. [3+1+2+4]
8. a) How can synchronous growth of a bacterial culture be obtained? In what way could a synchronously growing culture be useful for the electron microscopist who is trying to determine the cytological changes associated with bacterial growth?
- b) What are 'photolithoautotrophs' and 'photoorganoheterotrophs'? Explain with example.
- c) What are the advantages and disadvantages of pour plate method for the isolation of microorganisms in pure culture? [(2+2)+(1.5+1.5)+(1.5+1.5)]
9. a) Classify bacteria on the basis of their temperature requirements. Explain with proper example.
- b) Define natural and synthetic media. Explain with example.
- c) Indicate the various toxic derivatives of oxygen and explain how aerobic organisms might protect themselves against these derivatives. [4+(1.5+1.5)+3]

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