

M.Sc. BIOTECHNOLOGY
First Semester
Microbiology

(MBT - 02)

Duration: 3Hrs.

Full Marks: 70

Part-A (Objective) =20

Part-B (Descriptive)=50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

1. Define recombination in bacteria. Give a brief diagrammatic description of the conjugation process in bacteria. **2+5=7**

2. Discuss the various phases of bacteriological analysis of water for detection of fecal contamination. **7**

or

What do you mean by phyllospheric microbes? Add a brief explanatory note on the role of phyllospheric microbes. **2+5=7**

3. Draw a labeled diagram showing the ultra structure of bacteria. Mention the important differences between the cell wall of gram-positive and gram-negative bacteria **4+3=7**

4. What is a pure culture? Discuss the important techniques employed to obtain pure culture from a mixed microbial culture. **1+6=7**

or

Define biogeochemical cycle. Draw and briefly describe the cycling of sulphur in the atmosphere. **1+3+3=7**

6. Add brief notes on the following (any *three*):

4×3=12

- a) Sexduction
- b) Food preservatives
- c) Working principle of phase contrast microscope
- d) Dermatophytic problems in man
- e) Pathogenicity

7. Why the study of transmission of virus is important? Discuss the various methods of transmission in plant viruses. Write the characteristic features of viroids.

2+5+3=10

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(The figures in the margin indicate full marks for the questions)

Duration: 20 minutes

Marks – 20

PART A- Objective Type

Choose the correct option for the following questions:

1×20=20

- i. Frederick Griffith's discovery of transformation in bacteria was based on his study of _____.
a) *Diplococcus pneumonia* b) *Haemophilus influenza*
c) *Escherichia coli* d) *Salmonella typhimurium*
- ii. Samuel A. Waksman extracted antibiotic streptomycin from _____.
a) *Aspergillus niger* b) *Streptomyces venezualae*
c) *Streptomyces griseus* d) both a) and b)
- iii. The process of *phagocytosis* was described by _____.
a) Paul Ehrlich b) Elie Metchnikoff c) Emil von Behring d) all of the above
- iv. Water as a carrier of disease was first identified by _____.
a) Lazzaro Spallanzani b) Ignaz Semmelweis c) Edward Jenner d) John Snow
- v. High frequency recombinants in bacteria was discovered by _____.
a) Barbara McClintock b) Frederick Sanger c) William Hayes d) Francois Jacob
- vi. The largest known viroid described so far is _____.
a) cucumber pale-fruit viroid b) potato spindle tuber viroid
c) citrus exocortis viroid d) none of the above
- vii. The inhibitory mechanism of heavy metals against microbes is termed as _____.
a) oligodynamic action b) incineration c) competitive inhibition d) sterilization
- viii. Sub-viral particles without genetic element are known as _____.
a) viroids b) prions c) virusoid d) rickettsia
- ix. Important insect vector transmitting TMV to tobacco leaves is _____.
a) fruit fly b) butterfly c) beetle d) grass-hopper
- x. Flour falls under the food material that are _____.
a) non-perishable b) semi-perishable c) highly perishable d) None of the above

- xi. *Streptococcus lactis* that survives the pasteurization temperature is known as _____.
a) thermophile b) thermodeuric c) acidophilic d) heat resistant
- xii. _____ test is done for the determination of acetyl-methyl carbinol production by bacteria.
a) disodium hydrogen phosphate
b) sodium dihydrogen phosphate
c) dipotassium hydrogen phosphate
d) disodium phenyl phosphate
- xiii. In case of sporulating fungi, the preservation method recommended is _____.
a) over layering with paraffin oil
b) over layering with mineral oil
c) drying in gelatin disc
d) preservation in soil
- xiv. *Nitrosomonas* is responsible for the conversion of _____.
a) NH_4 to NO_2 b) NO_3 to NO_2 c) NO_2 to NO_3 d) NH_4 to atmospheric N_2
- xv. Rhizospheric microbes inhibit the root pathogens through the association called _____.
a) parasitism b) synergism c) antagonism d) mutualism
- xvi. The process of fractional sterilization using steam Arnold is popularly known as _____.
a) pasteurization b) tyndallization c) radiation d) incineration
- xvii. pigment(s) associated with phase-contrast microscopy is/are _____.
a) fluorescein b) rhodamine c) methylene blue d) both a) and b)
- xviii. The first useful compound microscope was developed by _____.
a) Jacckarius Jansen and Hans Lippersey
b) Robert Hooke
c) Leuwen Hoek
d) Galileo
- xix. *Koch's postulation*, establishing the relationship between microbes and disease was based on Robert Koch's study on _____.
a) *Mycobacterium tuberculosis*
b) *Bacillus anthracis*
c) *Clostridium botulinum*
d) *Yersinia pesits*
- xx. Bacterial recombination accomplished with the help of viruses is known as _____.
a) transformation
b) transduction
c) conjugation
d) none of the above
