

Semester- III
Course MI-203
Microbiology Practicals

1. Study of different types of media and their ingredients.
 - A. Selective media: Rose Bengal agar medium
 - B. Differential media: MacConkey's medium, EMB agar medium, triple sugar iron agar medium
 - C. Enrichment media: Selenite broth
 - D. Enriched media: Blood agar medium, glucose yeast extract agar medium
 - E. Natural media: Soil extract agar, potato dextrose agar medium
2. Qualitative analysis of biomolecules:
 - A. Carbohydrates: Iodine test, Molisch's test, Benedict's test, Barfoed test, Bial's test and Saliwanoff's test
 - B. Proteins: Biurate test, Ehrlich's test, glyoxilic acid test, xanthoproteic test.
3. Determination of absorption maxima of a colored solution (use methylene blue 1:20,000 dilution)
4. Study of effect of antibiotics on bacteria
 - A. Study of sensitivity spectrum of antibiotic against the test organism by use of paper disc method
 - B. Determination of spectrum of activity of an antibiotic by use of agar ditch method
5. Study biochemical reaction of bacteria
 - A. Based on carbon source
 - i. Oxidative and fermentative breakdown of glucose
 - ii. Fermentation of sugars and sugar alcohol: glucose, xylose, mannitol, lactose, maltose and sucrose
 - iii. Glucose breakdown product: Methyl red test, Voges-Proskauer's test
 - iv. Citrate utilization test
 - v. Starch utilization test
 - vi. Lipid utilization test
 - B. Based on nitrogen source
 - i. Indole production test
 - ii. H₂S production test
 - iii. Urea utilization test
 - iv. Casein hydrolysis test
 - v. Gelatin hydrolysis test
 - vi. Deamination test

- D. Other tests
 - i. Catalase test
 - ii. Dehydrogenase test
 - iii. Oxidase test
- 6. Microbiological analysis of soil
 - A. Enumeration of organisms from soil (standard plate count from soil)
 - B. Isolation of symbiotic & non-symbiotic nitrogen fixing bacteria & actinomycetes from soil
- 7. Microbiological analysis of drinking water
 - A. Standard plate count of drinking water
 - B. Detection of fecal pollution of water by performing presumptive test, confirmed test and completed test.
 - C. Determination of MPN of coliforms in water

Scheme for Examination

<u>Ex</u>	<u>Marks</u>
1. Microbiological analysis of soil / water (any one)	15
A. Standard plate count of water / soil sample	
B. Determination of MPN for coliforms in water sample	
C. Presumptive and confirmed test for water	
D. Confirmed and completed test for water	
2. Biochemical reactions of bacteria (any five)	15
3. General Exercise: (any one)	15
A. Study of effect of antibiotics on test organism by paper disc method	
B. Determination of spectrum of activity of an antibiotic by use of agar ditch method	
C. Determination of absorption maxima	
D. Qualitative analysis of protein or carbohydrates	
E. Study of cultural and morphological characteristic of actinomycetes	
F. Cultivation and study of nitrogen fixing bacteria from soil	
4. Spotting	10
5. Viva	10
6. Journal and slides	<u>05</u>
Total	70

