

U.G. 2nd Semester Examination - 2020**MICROBIOLOGY****[HONOURS]****Course Code : MB-H-CC-L-04****(Instrumentation and Biotechniques)**

Full Marks : 40

Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***Answer all the questions.**

1. Answer any **five** of the following: $2 \times 5 = 10$
- i) Write down the difference between colorimeter and spectrophotometer.
 - ii) What is the role of β -mercaptoethanol in SDS-PAGE?
 - iii) Why is immersion oil used during observation under light microscope with 100X lens?
 - iv) Define molar extinction co-efficient.
 - v) What is partition co-efficient?

- vi) Name four components used in Column chromatography.
- vii) What is differential centrifugation?
- viii) Differentiate between fixed angle rotor and swinging bucket rotor.

2. Answer any **two** of the following questions:

 $5 \times 2 = 10$

- i) What is the difference between brightfield and darkfield microscopy? When do we use phase contrast microscopy? $3+2$
- ii) What is the component of paper chromatography? Briefly describe the applications of paper chromatography. $2+3$
- iii) What is the basic principle of centrifugation? What is the difference between centrifuge and ultracentrifuge? $2+3$
- iv) What is the principle of polyacrylamide gel electrophoresis? What does SDS do in gel electrophoresis? $2+3$

3. Answer any **two** of the following questions:

 $10 \times 2 = 20$

- i) What is the application of fluorescence microscope? What are the main elements of a

confocal microscope? Why are electrons used in electron microscopy? 3+4+3

ii) Why silica gel is used in TLC? What are the advantages of thin layer chromatography? Write down the principle of HPLC method. 2+3+5

iii) What are the factors affecting sedimentation? What is the difference between differential centrifugation and density gradient centrifugation? What is isoelectric focusing? 4+3+3

iv) What is the basic principle of UV Visible Spectroscopy? What is the range of UV? Write down the limitations of Beer-Lambert's law. 6+1+3
