

(6 pages)

Reg. No. : .....

Code No. : 10387 E      Sub. Code : EEMI 21/  
FEMI 21

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2025.

Second Semester

Microbiology

Elective – BIOINSTRUMENTATION

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Sorenson's pH scale 0-14 is based on the ionic product of \_\_\_\_\_.
- (a) Carbon                      (b) Hydrogen  
(c) Water                        (d) Chlorine

2. The autoclave was invented by \_\_\_\_\_.
- (a) Louis Pasteur  
(b) Charles Chamberland  
(c) Leevonhoek  
(d) Joseph Lister
3. Mass spectrometry, the compound under investigation is bombarded with a beam of \_\_\_\_\_.
- (a) protons                      (b) neutrons  
(c) spectrum                    (d) electrons
4. The wavelength of light, which the human eye can perceive, ranges from \_\_\_\_\_ nanometers (nm).
- (a) 400 to 700                    (b) 100 to 200  
(c) 200 to 300                    (d) 300 to 400
5. The 'Electrophoretic mobility' is defined as the distance travelled by the particles in \_\_\_\_\_ under the potential gradient of one volt per centimetre.
- (a) one minute                    (b) one second  
(c) ten minutes                    (d) an hour
6. \_\_\_\_\_ types of gels are used as supporting media to separate complex mixtures.
- (a) Starch gel                      (b) Agar gel  
(c) Polyacrylamide gel          (d) All of these

7. \_\_\_\_\_ discovered that Uranium compounds produced three different kinds of radiation.  
(a) Ernest Rutherford (b) Henri Becquerel  
(c) Edward (d) Newton
8. Radioisotopes are found in natural components except \_\_\_\_\_.  
(a) Uranium (b) Plutonium  
(c) Sodium (d) Thorium
9. \_\_\_\_\_ method can locate radioisotopically labelled molecules in the sections of cells or tissues.  
(a) Autoradiography (b) Cerenkov counting  
(c) Chemical quenching (d) Optical quenching
10. \_\_\_\_\_ is used to detect and quantify the elements sodium, potassium, lithium, magnesium, calcium, strontium and barium.  
(a) ELISA  
(b) Autoradiography  
(c) Flame photometry  
(d) Gel electrophoresis

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Focus on the importance of buffer in biological systems.  
Or  
(b) Write about the working principle of laminar air flow.
12. (a) Discuss about principle and applications of colorimeter.  
Or  
(b) State the principle and application of mass spectroscopy.
13. (a) Write a notes on column chromatography.  
Or  
(b) Explain briefly about PAGE.
14. (a) Focus on the instrumentation and application of CT scan.  
Or  
(b) Write short notes on PET scan radioisotopes.

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15. (a) Explain briefly about spectrofluorometer.

Or

(b) Write the working principle of autoradiography.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write a detail notes on principle and applications of an autoclave. With neat diagram.

Or

(b) Discuss in detail about phosphate and acetate buffer.

17. (a) Focus on instrumentation principle and applications of ultra violet spectrometer.

Or

(b) State the working principle and application of visible spectroscopy.

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18. (a) Describe HPLC and its operation.

Or

(b) Write descriptive notes on Agarose gel electrophoresis.

19. (a) Write a detail notes on MRI scan.

Or

(b) Discuss in detail about electromyogram.

20. (a) Describe the principle and application of scintillation counter.

Or

(b) What is measured by a Geiger counter and its advantages?

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