

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022  
(Fifth Semester)

Branch – BIOTECHNOLOGY

ANALYTICAL TECHNIQUES

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 x 1 = 10)

- 1 What symbol is used to denote 'molality'?  
(i) M (ii) m  
(iii) mM (iv) n
- 2 Which of the followings is not acidic pH?  
(i) 5 (ii) 4  
(iii) 7 (iv) 1
- 3 In which type of chromatography, the stationary phase held in a narrow tube and the mobile phase is forced through it under pressure?  
(i) Column chromatography (ii) Planar chromatography  
(iii) Liquid chromatography (iv) Gas chromatography
- 4 In chromatography, the stationary phase can be \_\_\_\_\_ supported on a solid.  
(i) Solid or liquid (ii) Liquid or gas  
(iii) Solid only (iv) Liquid only
- 5 Which of the following is not a type of centrifugation?  
(i) Hydro cyclone (ii) Tubular centrifuge  
(iii) Microfiltration (iv) Disk stack separator
- 6 Which of the following centrifugation is used to separate certain organelles from whole cell?  
(i) Rate-zonal centrifugation (ii) Normal centrifugation  
(iii) Differential centrifugation (iv) Isopycnic centrifugation
- 7 Beer's law states that the intensity of light decreases with respect to \_\_\_\_\_.  
(i) Concentration (ii) Distance  
(iii) Composition (iv) Volume
- 8 Which of the following is not true about Absorption spectroscopy?  
(i) It involves transmission  
(ii) Scattering is kept minimum  
(iii) Reflection is kept maximum  
(iv) Intensity of radiation leaving the substance is an indication of concentration
- 9 Three types of radioactive elements are emitted when unstable nuclei undergo radioactive decay. Which of the following is not one of them  
(i) Beta (ii) Gamma  
(iii) Alpha (iv) delta
- 10 'When nuclear radiations pass through, gas ionization is produced.' This is the principle of which of the following detectors?  
(i) Proportional counter (ii) Flow counter  
(iii) Geiger Muller counter (iv) Scintillation counter

Cont...

**SECTION - B (25 Marks)**Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 x 5 = 25)

- 11 a Write short notes on molarity and advantages and disadvantages.  
OR  
b What is buffer? Explain its types
- 12 a Discuss the applications of thin layer chromatography.  
OR  
b Write basic principle and applications of electrophoresis.
- 13 a Explain principle of freeze drying.  
OR  
b Signify the role of Water Softeners.
- 14 a Explain principle of Spectrofluorimetry.  
OR  
b Elucidate the principle of atomic absorption spectroscopy.
- 15 a Explain autoradiography.  
OR  
b Discuss the application of radioisotopes in biological science.

**SECTION -C (40 Marks)**Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 x 8 = 40)

- 16 a Explain pH meter and its applications.  
OR  
b What is a Biosensor? How Does a Glucose Sensor Works?
- 17 a Briefly explain SDS- PAGE.  
OR  
b Explain the principle and procedure of Gas – Liquid Chromatography (GLC).
- 18 a Briefly explain analytical ultracentrifuge.  
OR  
b Describe Density gradient centrifugation.
- 19 a Briefly explain flow cytometry.  
OR  
b Describe Raman spectroscopy.
- 20 a Explain scintillation counter – principle of operation.  
OR  
b Explain the construction and working principle of GM counter.

Z-Z-Z

END