

**B. Sc. MEDICAL TECHNOLOGY (LABORATORY) (BMLT)
SEMESTER -IV EXAMINATION, JUNE-2026**

(BMLT401) INSTRUMENTATION IN BIOCHEMICAL ANALYSIS

[Time allotted: Three Hours]

[Max Marks: 100]

Note: Read all the instructions carefully

Answer all questions in serial order. Draw suitable diagrams wherever necessary

Q. 1. Objective type questions: (Attempt All)**(10 x 02 = 20)**

(Very short/ short answer/ MCQ/ One liners/ Fill in the blanks/ True/False)

- a. Which of the following is NOT an advantage of automation in the Clinical Chemistry Laboratory- (PO1,2,4,5- CO5)
 - i. Minimizes variations in results
 - ii. Increases labour component of a given investigation
 - iii. can eliminate potential errors of pipetting
 - iv. is cost effective
- b. Absorbance is equal to- (PO1,2,- CO5)
 - i. $2 + \log T$
 - ii. $2 - \log T$
 - iii. $2 \times \log T$
 - iv. $\log T / 2$
- c. Colorimeter can be used to measure wavelength in which range- (PO1,2,- CO5)
 - i. 200 nm – 600 nm
 - ii. 350 nm – 700 nm
 - iii. 460 nm – 840 nm
 - iv. 150 nm – 800 nm
- d. In paper chromatography water forms the- (PO1,2, - CO5)
 - i. Mobile phase
 - ii. Stationary phase
 - iii. Support media
 - iv. None of the above
- e. In paper chromatography the amino acids give which color with Ninhydrin- (PO1,2, - CO5)
 - i. Red
 - ii. Green
 - iii. Blue
 - iv. Purple
- f. Blank is the one which contains - (PO1,2, - CO5)
 - i. All the test reagents + serum
 - ii. All the test reagents + serum but not given the conditions for reactions
 - iii. Does not contain all the reagents
 - iv. Contains only distilled water + reagent
- g. Which is TRUE- (PO1,2,- CO5)
 - i. $\text{Conc. of test} = \text{OD of Test} / \text{OD of standard} \times \text{conc. of standard}$
 - ii. $\text{Conc. of test} = \text{OD of standard} / \text{OD of Test} \times \text{conc. of standard}$
 - iii. $\text{Conc. of test} = \text{OD of Test} + \text{OD of standard} / \text{conc. of standard} \times \text{OD of control}$
 - iv. $\text{Conc. of test} = \text{OD of Test} \times \text{OD of standard} / \text{conc. of standard} + \text{OD of control}$
- h. Write full form of ELISA (PO1,2,4,5- CO5)
- i. What is the significance of using blank in quantitative estimation? (PO1,2, - CO5)
- j. Write full form of ISE. (PO1,2,- CO5)

Q. 2. Short notes/ Short answer type questions (Attempt any Five)**(05 x 04 = 20)**

- a. Principle of Dry Chemistry analyzer (PO1,2, - CO5)
- b. Chemiluminescence (PO1,2, - CO5)
- c. Describe the Beer Lamberts Law and its applications in biochemical analysis (PO1,2, - CO5)
- d. Advantages of Liquid chemistry analyzer (PO1,2, - CO5)
- e. What is ascending paper chromatography? Explain (PO1,2, - CO5)
- f. List the areas of a manual technical process which are commonly automated in a clinical chemistry analyzer (PO1,2,3,4 - CO5)
- g. At which filter you would take the readings, when estimating a sample of glucose in serum by o-toluidine method? Justify the reason (PO1,2, - CO5)

Q. 3. Structured questions (Attempt any Three)**(03 x 10 = 30)**

- a. Write the principle & applications of HPLC (PO1,2, - CO5)
- b. Draw a diagrammatic representation of a colorimeter (PO1,2, - CO5)
- c. Give the principle & applications of ELISA (PO1,2, - CO5)
- d. Describe the principle and uses of flame photometer with a suitable diagram. (PO1,2, - CO5)

Q. 4. Long Answer/ Essay type questions (Attempt any Two)**(02 x 15 = 30)**

- a. What is automation? What are the advantages of automation in a Clinical Biochemistry Lab? (PO1,2,4,5 - CO5)
- b. Write the principle and application of Blood gas analyzer. (PO1,2, - CO5)
- c. Write the principle of electrophoresis. Describe how a mixture of proteins can be separated by gel electrophoresis. (PO1,2, - CO5)