BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B. PHARM. **SEMESTER: VII**
BRANCH: PHARMACY **SESSION: MO25**

SUBJECT: BP701T INSTRUMENTAL METHODS OF ANALYSIS

TIME: 3.00 Hours **FULL MARK: 75**

INSTRUCTIONS:

1. **The missing data, if any, may be assumed suitably.**
2. **Before attempting the question paper, be sure that you have got the correct question paper.**
3. **Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**
4. **This question paper consists of (03) three parts. Read the part wise instructions before attempting the questions.**

PART-I
Objective types questions (Instruction: Answer all questions)

Q1. (10 x 2 = 20 Marks)

A. Beer-Lambert's law states that absorbance is directly proportional to _____ and _____.

B. A shift of absorption maximum to longer wavelength is called _____ shift, whereas a shift to shorter wavelength is called _____ shift.

C. Derivatization in GC improves _____ of analytes and enhances _____.

D. In Thin Layer Chromatography (TLC), the stationary phase is _____ gel or alumina, and the support is usually _____ plate.

E. Electrophoresis is the migration of _____ particles under an applied _____ field.

F. Calculate the wave number of stretching vibration of carbon-carbon double bond ($K=10\times10^5$ dynes cm^{-1})

G. What is the use of hollow cathode lamp?

H. Write the significance of the fingerprint region in IR Spectroscopy

I. Mention the different types of stretching and bending vibrations observed in FTIR.

J. Differentiate between the nephlometer and turbidimeter

PART-II
Short Answers
(Instruction: Answer seven out of nine questions)

(7 x 5 = 35 Marks)

Q2. Discuss the instrumentation of UV-Vis spectroscopy with the help of a neat, labelled diagram.
Q3. Differentiate between singlet and triplet electronic states in fluorimetry with the Jablonski Diagram.
Q4. Discuss the working of Gas Chromatography with the help of a neat, labelled diagram.
Q5. Discuss the instrumentation of UV-Vis spectroscopy with the help of a neat, labelled diagram.
Q6. Explain the instrumentation and applications of flame photometry with a suitable diagram.
Q7. Explain the factors affecting vibrational frequency in IR spectroscopy
Q8. Discuss briefly on gel chromatography
Q9. Explain the different types of sampling techniques observed in IR spectroscopy
Q10. Give a detailed note on different types of ion exchange resins, the mechanism of ion exchange, factors affecting ion exchange and its applications

PART-III
Long Answers
(Instruction: Answer two out of three questions)

(2 x 10 = 20 marks)

Q11. Explain the working of SDS-PAGE with its application in pharmaceutical analysis.
Q12. Describe in detail note on principle, instrumentation & applications of HPLC
Q13. Give a detailed note on the different types of detectors used in IR Spectroscopy

::::::19/11/2025::::::M