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Rajiv Gandhi University of Health Sciences, Karnataka

IV Year B.Pharm Degree Examination – JAN-2019

Time: Three Hours **Max. Marks: 70 Marks**

INSTRUMENTAL & BIO-MEDICAL ANALYSIS

(Revised Scheme – 3)

Q.P. CODE: 2617

Your answers should be specific to the questions asked
Draw neat labeled diagrams wherever necessary

LONG ESSAYS (Answer any Two) **2 x 10 = 20 Marks**

1. Discuss the constitution of different ion exchange materials used in chromatography and explain the principle involved in the separation of mixtures by ion exchange chromatography.
2. Draw a neat, labeled schematic diagram of a double beam UV – Visible spectrophotometer and explain its working. Discuss the construction and working of photo multiplier tube and silicon diodes used in UV-Visible spectrophotometers.
3. a) With the help of a neat, labeled diagram, explain the optical path and working of a spectrofluorimeter.
   b) What are the structural features required for a compound to show fluorescence?

SHORT ESSAYS (Answer any Six) **6 x 5 = 30 Marks**

4. Discuss the merits and demerits of potentiometric titrations over conductometric titrations.
5. What shape of curve do you expect for each of the conductometric titrations? Justify your answer.
   (a)Sodium acetate versus HCl; (b)Sulphuric acid versus Ammonia followed by NaOH.
6. Give a mathematical expression to show the relation between absorbance and concentration. Explain the different modes of expressing concentration.
7. Briefly explain validation methods for quality assurance.
8. Explain the principle of flame emission spectroscopy. What are the various components present in a flame emission spectrophotometer?
9. Give the wavelength ranges for vacuum UV, UV, visible, near IR, mid IR and far IR radiations and mention their relative energies.
10. What is λ_{max}? Explain why, it is selected in quantitative UV – Visible spectrophotometry.
11. Highlight the differentiating features of preparative TLC from analytical TLC.

SHORT ANSWERS **10 x 2 = 20 Marks**

12. Calculate the Rm value of glucose, if its R_f value is 0.25.
13. Give any two official pharmaceutical applications of gas chromatography.
14. Name any four detectors used in IR spectrophotometers.
15. What is isosbestic point? What is its significance in UV-Visible spectrophotometry?
16. Why, nephelometric measurements of scattered light are, carried - out, at right angles to the incident light?
17. Explain the effect of pH on fluorescence.
18. Which reference and indicator electrodes can be used for the following potentiometric titrations:
    (a) Acid-Base titrations, (b) Red-ox titrations?
19. Give the path lengths generally used for liquids and gases in IR spectroscopy.
20. Which functional groups are indicated for IR absorption peaks of 1700 cm^{-1} and 3450 cm^{-1}?
21. Outline the principle of electrophoresis.

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