

PARUL UNIVERSITY
PARUL INSTITUTE OF APPLIED SCIENCES
MID SEMESTER INTERNAL EXAMINATION, MARCH 2019
B. Sc. Chemistry/Geology/Maths/Physics Semester II

Paper Name: Basic Instrumentation Techniques

Date: 06/03/2020

Paper Code: 11105153

Time: 1hr 30min

Max. Marks: 40

Instructions:

1. All questions are compulsory and options are given in first and second question only.
 2. Numbers to the right of question indicate the marks of respective question.
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Q. 1 Attempt any *one* question of the following. **(08)**

- (i) Explain Lamber's and Beer Law in detailed
- (ii) Explain Electronic Transitions due to UV radiation.

Q. 2 Attempt any *three* questions from the following. **(12)**

1. Describe Hook's Law
2. Give Classification of instrumental methods
3. Explain interaction of X-ray and IR radiation with matter
4. Explain Hyper and Hypochromic Effect in detailed
5. Draw Instrumentation of UV –Visible spectroscopy and explain

Q. 3 Do as directed. Attempt *all* five questions. **(05)**

1. Give definition of Spectroscopy
2. Draw the Structure of Xenon Discharge lamp
3. Give relation between Accuracy and Precision through diagram.
4. Give one difference between Absorption and Emission Spectroscopy
5. Draw Energy Level Diagram for Molecule A-B

Q. 4 Write correct option in your answer sheet for following 15 multiple choice questions. **(15)**

1. In electromagnetic spectrum $\lambda \times \nu = ?$
 - a) viscosity
 - b) velocity
 - c) quantity
 - d) capacity
2. What is the X-ray range in Electromagnetic spectrum?
 - a) 10^{-10} cm^{-1}
 - b) 10^{-12} cm^{-1}
 - c) 10^{-2} cm^{-1}
 - d) 10^{-5} cm^{-1}
3. $A = \epsilon cl$, where, $\epsilon =$ _____
 - a) Molar Conductivity
 - b) Molar Sorption Co-efficient
 - c) Molar Concentration
 - d) Molar Extinction Coefficient
4. Which technique will follow emission of radiation if EMR apply?
 - a) Mass Spectrometry
 - b) UV-Visible Spectroscopy
 - c) Kinetics Methods
 - d) X-ray

5. Which one is instrumental method?
 - a) Precipitation
 - b) Extraction
 - c) Fluorescence
 - d) Distillation
6. What is Accuracy?
 - a) Closeness with True Value
 - b) Nearness with exact value
 - c) Closeness with Reproducibility
 - d) Nearness with Reproducibility
7. Microwave radiation affect matter through_____
 - a) Photoionization
 - b) Molecular Vibration
 - c) Electron level Change
 - d) Molecular Rotation and Torsion
8. Finger print region of IR spectroscopy is _____ cm^{-1}
 - a) 4000-1000
 - b) 4000-1500
 - c) 2000-500
 - d) 1500-600
9. How many vibrations occur in CO_2 ?
 - a) 5
 - b) 4
 - c) 3
 - d) 2
10. What is the source of Globlar Rod Source of IR?
 - a) Zirconium Oxide
 - b) Silicon Carbide
 - c) Silicon Oxide
 - d) Zirconium Carbide
11. TV remote is working on_____
 - a) Radio
 - b) Visible
 - c) UV
 - d) IR
12. Near UV Range is_____ cm^{-1}
 - a) 400-200
 - b) 400-190
 - c) 390-180
 - d) 190-100
13. When Hypsochromic occur so, λ_{max} of Aniline shifted from 280 to_____ nm
 - a) 265
 - b) 266
 - c) 267
 - d) 268
14. Hydrogen Discharge Lamp is used as source for_____
 - a) IR
 - b) Visible
 - c) IR-UV
 - d) UV-Visible
15. Which organic compound (give red colour) present in Tomato?
 - a) Ecosprine
 - b) Trysophene
 - c) Lycophene
 - d) Cyclophene

-- End of Paper--