V P & R P T P SCIENCE COLLEGE – VALLABH VIDYANAGAR

B.Sc.-Semester VI US06CPHY22

QUESTION BANK 2020-21

Unit: IV

Part-1: Multiple Choice questions:

1. If the value of Raman shift is positive the Raman spectrum said to consist of _____.
   (a) Rotational lines (b) vibrational lines (c) Anti-Stokes' lines (d) **Stokes' lines**
2. Stokes' lines are frequently much more _____ than the anti-Stokes' lines.
   (a) thinner (b) broader (c) **intense** (d) weaker
3. Under high resolution Stokes' lines and anti-stokes' lines are found to be composed of _____ fine structure.
   (a) vibrational (b) **rotational** (c) electronic (d) All of above
4. Raman spectra are useful to investigate the structure of _____.
   (a) **molecule** (b) Atom (c) matter (d) liquid
5. _____ are used in Raman's apparatus to observe Raman effect.
   (a) **Liquid filters** (b) glass filters (c) Multi colour filters (d) Special type of prisms
6. One end of Raman tube is kept _____in Raman apparatus.
   (a) curved (b) **Horn shaped** (c) open (d) close
7. Helium discharge tube filtered by nickel oxide glass gives monochromatic lines of wave length _____Å.
   (a) 4583 (b) 2598 (c) **3888** (d) 4358
8. Raman spectra also known as _____spectra.
   (a) Wood-Raman (b) Baer- Raman (c) **Smekal-Raman** (d) None of above
9. The Raman lines are strongly _____.
   (a) Sharpened (b) Weakened (c) Non polarized (d) **polarized**
10. Oxygen, Hydrogen and Nitrogen give a pattern of _____lines.
    (a) evenly space (b) **equally space** (c) missing (d) double space

Part-2: Short answer questions:

i. Define: (1) Raman shift, (2) Stokes' lines and (3) anti-Stokes' lines
ii. Enlist chief features of a spectrograph.
iii. Explain in short-The importance of Raman effect.
iv. Write the differences of Raman spectra and Infra red absorption spectra.

v. Write the differences of Raman spectra and fluorescence spectra.

vi. Enlist the applications of Raman effect in Physics.

Part-3: Long answer questions:

1. Write a note on the salient features of Raman effect.
2. Discuss the experimental arrangement to observe the Raman spectra.
3. Describe the results of Raman spectra in gases.
4. Describe the results of Raman spectra in liquids.
5. Explain diatomic and triatomic molecular structures.
6. With the proper derivations discuss the classical theory of Raman effect.
7. With the proper derivations discuss the quantum theory of Raman effect.

?═══════════ψψψ═══════════?