TELANGANA UNIVERSITY
S.S.R. DEGREE COLLEGE, NIZAMABAD (C.C:5029)
V SEMESTER INTERNAL ASSESSMENT I EXAMINATIONS
MODERN PHYSICS QUESTION BANK

I. Multiple choice questions. 10 X ½ = 5

1. Which one is alkali metal [c]

a. 0 b. C c. Li d. None

2. Photon energy is given by [d]

a. $E = \vartheta$ b. E = mgh c. $E = \frac{1}{2}mv^2$ d. $E = h\vartheta$

3. Debroglies wavelength is given by [b]

a. $\lambda = \frac{1}{mv}$ b. $\lambda = \frac{h}{mv}$ c. $\lambda = mv$ d. None

4. Expression for phase velocity Vp = [a]

a. $\frac{\omega}{k}$ b. $\frac{d\omega}{dk}$ c. $\frac{k}{\omega}$ d. $\frac{dk}{d\omega}$

5. Heisenberg ussectainty principle is [c]

a. Δx b. $\Delta x.\Delta\theta \geq \hbar$ c. $\Delta x.\Delta p \geq \hbar$ d. $\Delta x.\Delta t \geq \hbar$

6. Reduced mass μ = [d]

a. $m_1 + m_2$ b. $\frac{1}{m_1 + m_2}$ c. $\frac{m_1 + m_2}{m_1 m_2}$ d. $\frac{m_1 m_2}{m_1 + m_2}$

7. $\lambda + \Delta\lambda$ is the wavelength of _____ lines [b]

a. Anti stokes b. Stokes c. Raylight d. None

8. Selection rule for vibrational spectrum is [a]

a. $\Delta v = \pm 1$ b. $\Delta v = 0$ c. $\Delta v = 0, \pm 1$ d. $\Delta v = \infty$

9. The frequency of SHO is w = [c]

a. $\frac{k}{\mu}$ b. $\sqrt{\frac{\mu}{k}}$ c. $\sqrt{\frac{k}{\mu}}$ d. $\frac{\mu}{k}$

10. For absorption rotation spectrum ΔJ = [d]

a. ± 1 b. 0 c. -1 d. +1

II. Fill in the blanks 10 X ½ = 5

1. Group velocity = <u>phase velocity</u> - $\lambda.\frac{dv_p}{d\lambda}$
2. Resolving from of electron microscope is <u>1000</u> times better than normal microscope
3. Momentum operator in Q-M is $-i\hbar\nabla$
4. $\Psi - \Psi^* = |\psi|^2$
5. Saturation current is α = <u>internity of incident radiation</u>
6. Vibrational spectrum obtained is <u>near IR</u> region
7. Selection rule for vector atomic model ΔJ = 0, ± 1
8. Principles series is from P to S
9. <u>mj + 2ms</u> strong magnetic quantum number
10. If applied E-F is less than 10^7 v/m then it is <u>2nd order stark</u> effect

III. Short Answers 5 X 1 = 5

1. What is photo electric effect?
2. Write 2-distiinct features of vector atomic model?
3. Write spectral notation for which S = +1/2 and l = 1
4. Write Shrodinger time independent wave equation?
5. Draw vibrational energy levels?

IV. Assignment 1 X 5 = 5