**22CHU309N / 22BCU311N/22CHU309**

**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**BSc DEGREE EXAMINATION MAY 2025**
(Third Semester)

Common to Branches- **CHEMISTRY & BIOCHEMISTRY**

**PHYSICS -I**

Time: Three Hours

Maximum: 75 Marks

**SECTION-A (10 Marks)**

Answer **ALL** questions

**ALL** questions carry **EQUAL** marks (10 × 1 = 10)

| Module No. | Question No. | Question | K Level | CO |
|---|---|---|---|---|
| 1 | 1 | The fundamental frequency of a string is directly proportional to the square root of tension, when ---------- are constant.<br>i) tension & linear density (ii) length & linear density<br>(ii) length & tension (iv) length & frequency | K1 | CO1 |
| | 2 | The Sabine's formula for Reverberation tome is<br>(i) $T = \frac{0.158}{\sum \alpha A}$ (ii) $T = \frac{0.158\,A}{\sum \alpha V}$<br>(iii) $T = \frac{0.158\,V}{\sum \alpha A}$ (iv) $T = \frac{0.158\,\alpha}{\sum VA}$ | K2 | CO1 |
| 2 | 3 | The ratio of change in diameter to original diameter is known as<br>(i) Shearing strain (ii) volume strain<br>(iii) linear strain (iv) lateral strain | K1 | CO2 |
| | 4 | When the temperature increases, the surface tension of all liquids<br>(i)Decreases (ii) Increases<br>(iii) Remains constant (iv) first increases then decreases | K2 | CO2 |
| 3 | 5 | The first law of thermodynamic establishes relation between heat and ------<br>(i) mass (ii) volume (iii) work (iv) entropy | K1 | CO3 |
| | 6 | A superfluid is a state of matter in which Helium II behaves like a liquid with<br>(i) Zero specific heat (ii) Zero viscosity<br>(iii)maximum density (iv) High viscosity | K2 | CO3 |
| 4 | 7 | Find the Biot- Savart's law.<br>(i) $dB = \left(\frac{\mu}{4\pi}\right)\frac{idl\sin\theta}{r^2}$ (ii) $dB = \left(\frac{\mu_0}{4\pi}\right)\frac{dl\sin\theta}{r^2}$<br>(iii) $dB\alpha\left(\frac{\mu_0}{4\pi}\right)\frac{i\,dl\sin\theta}{r^2}$ (iv) $dB\alpha\frac{i\,dl\sin\theta}{r^2}$ | K1 | CO4 |
| | 8 | When the average power consumed in the circuit is zero, then the current in the A.C. circuit is called<br>(i) Power factor (ii) Impedance<br>(iii) wattless (iv) Dissipation of power | K2 | CO4 |
| 5 | 9 | The ratio of the speed of light in vacuum to the speed of light in the medium is known as<br>i) Refractive index (ii) Dispersive power<br>(iii) Angle of refraction (iv) Deviation of light | K1 | CO5 |
| | 10 | A beam of white light passes through a prism, which of the following colour is deviated more?<br>(i) Red (ii) Green (iii) yellow (iv) Blue | K2 | CO5 |

**Cont...**

## SECTION - B (35 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

| Module No. | Question No. | Question | K Level | CO |
|---|---|---|---|---|
| 1 | 11.a. | Demonstrate the sonometer experiment to determine the frequency of an AC source. | K2 | CO1 |
| | | (OR) | | |
| | 11.b. | Outline the industrial and medical applications of ultrasonic waves. | | |
| 2 | 12.a. | Analyze the Poiseuille's method of determining coefficient of viscosity. | K4 | CO2 |
| | | (OR) | | |
| | 12.b. | Examine the excess pressure inside a liquid drop and soap bubble. | | |
| 3 | 13.a. | Describe Porous plug experiment and write the result obtained by Joule and kelvin. | K1 | CO3 |
| | | (OR) | | |
| | 13.b. | Find the change in entropy in a reversible process. | | |
| 4 | 14.a. | Show that when two charged conductors share their charges is always a loss of energy. | K1 | CO4 |
| | | (OR) | | |
| | 14.b. | How a choke coil is used to control the current in an A.C. circuit. | | |
| 5 | 15.a. | Describe how you would combine two prism to produce deviation without dispersion. | K3 | CO5 |
| | | (OR) | | |
| | 15.b. | Discuss the construction of direct vision prism. Mention its uses. | | |

## SECTION -C (30 Marks)

Answer **ANY THREE** questions

**ALL** questions carry **EQUAL** Marks (3 × 10 = 30)

| Module No. | Question No. | Question | K Level | CO |
|---|---|---|---|---|
| 1 | 16 | Explain the composition of two simple harmonic motion of equal periods at right angles. Discuss the different important cases. | K2 | CO1 |
| 2 | 17 | Describe the period of oscillation of a torsion pendulum and derive the expression for rigidity modulus of a cylindrical wire. | K4 | CO2 |
| 3 | 18 | Explain the principle of adiabatic diamagnetism. How will you employ this phenomenon to produce and measure very low temperature? | K1 | CO3 |
| 4 | 19 | Obtain the power factor and current values in an AC circuit. | K1 | CO4 |
| 5 | 20 | Find the refractive index of a prism in terms of angle of emergence when the ray is incident on the prism at the grazing angle. | K3 | CO5 |

Z-Z-Z END