TOTAL PAGES : 2

**22MAU103BN/22MCU103AN /24MCU103A**

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

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

Common to Branches – **MATHEMATICS & MATHEMATICS WITH COMPUTER APPLICATIONS**

**PHYSICS - I**

Time: Three Hours Maximum: 75 Marks

**SECTION-A (10 Marks)**
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (10 × 1 = 10)

| Question No. | Question | K Level | CO |
|---|---|---|---|
| 1 | Angular momentum is a _____ quantity.<br>a) Vector b) Scalar<br>c) Dimensionless d) real | K1 | CO2 |
| 2 | Which of the following devices uses the principle of angular momentum?<br>a) Voltameter b) Gyroscope<br>c) Stethoscope d) Otoscope | K2 | CO2 |
| 3 | Poisson ratio is defined as<br>a) Longitudinal strain divided by shearing strain<br>b) Longitudinal strain divided by lateral strain<br>c) Lateral strain divided by longitudinal strain<br>d) More than one of the above | K1 | CO2 |
| 4 | Modulus of rigidity is defined as the ratio of _<br>a) Longitudinal stress and longitudinal strain<br>b) Volumetric stress and volumetric strain<br>c) Lateral stress and lateral strain<br>d) Shear stress and shear strain | K2 | CO2 |
| 5 | When a stone is dropped in to a pond, the ripples formed on the surface of water are ___<br>a) transverse waves b) longitudinal waves<br>c) non-elastic waves d) elastic waves | K1 | CO3 |
| 6 | The frequency of free vibration<br>a) Resonant frequency b) Natural frequency<br>c) Center frequency d) Normal frequency | K2 | CO3 |
| 7 | A periscope makes use of:<br>a) Three spherical mirrors b) Two spherical mirrors<br>c) Two plane mirrors d) Three plane mirrors | K1 | CO4 |
| 8 | The optical element used to split a poly-chromatic light into its constituent component colors is called-<br>a) Reflection b) Spectrum<br>c) Total internal reflection d) Diffraction grating | K2 | CO4 |
| 9 | An Isotope without any Neutron is<br>a) Protium b) Deuterium<br>c) Trituim d) Silicon | K1 | CO3 |
| 10 | Thermal radiation extends over the range of<br>a) 0.01 μ to 0.1 μ b) 0.1 μ to 100 μ<br>c) 100 μ to 250 μ d) 250 μ to 1000 μ | K2 | CO3 |

**Cont...**

**SECTION - B (35 Marks)**

Answer **ALL** questions

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

| Question No. | Question | K Level | CO |
|---|---|---|---|
| 11.a. | Show the theorem of parallel axis with proper diagram. | K2 | CO2 |
| | (OR) | | |
| 11.b. | Explain moment of inertia of a solid sphere with diagram. | | |
| 12.a. | Determine the coefficient of rigidity of a wire. | K5 | CO4 |
| | (OR) | | |
| 12.b. | Agree the theory of cantilever loaded at one end. | | |
| 13.a. | Construct the Melde's experiment with diagram. | K3 | CO3 |
| | (OR) | | |
| 13.b. | Plan the detection of ultrasonic and list out the applications of ultrasonic. | | |
| 14.a. | Apply the definition of dispersive power and Summarize the Achromatic prism and Chromatic aberration. | K3 | CO3 |
| | (OR) | | |
| 14.b. | Plan distinction between interference and diffraction. | | |
| 15.a. | Conclude the properties of alpha and beta rays. | K5 | CO5 |
| | (OR) | | |
| 15.b. | Estimate the Half-life period and explain energy ranges of radioisotopes. | | |

**SECTION -C (30 Marks)**

Answer **ANY THREE** questions

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

| Question No. | Question | K Level | CO |
|---|---|---|---|
| 16 | Apply the theorem of perpendicular axis with diagram. | K3 | CO3 |
| 17 | Explain Cantilever supported at two ends and loaded in the middle. | K2 | CO2 |
| 18 | Analyze the velocity of transverse waves along a stretched string. | K4 | CO3 |
| 19 | Determine the achromatic combination of two thin lenses in contact. | K5 | CO4 |
| 20 | Explain Fundamental laws of radioactivity and indicate the activity of radioactive substances. | K2 | CO2 |

Z-Z-Z END