22MAU103BN/22MCU103AN/22MAU103B/ 20MAU03B/22MCU104A/20MCU04B

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(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)

Module No.	Question No.	Question	K Level	CO
1	1	The relation between the moment of inertia and the radius of gyration is given by,(k effective distance from the axis rotation) a.Mk^2 b.MK c.M^2k^2 d.m/k^2	K1	
	2	The unit of angular momentum is --------- a.Joule sec b. joule/sec c. watts d.watts/sec	K2	
2	3	If the temperature increases, the modulus of elasticity____. a. Decreases b. Remains constant c. Increases d. Zero	K1	
	4	When too many people stand on a bridge it collapses, why? a. Due to increase in stress b. Due to overweight c. Due to improper construction d. Due to friction	K2	
3	5	The fundamental frequency of vibration is given by a.$\frac{1}{2t}\sqrt{\frac{E}{\rho}}$ b.$\frac{2}{t}\sqrt{\frac{\rho}{E}}$ c. $\frac{1}{4t}\sqrt{\frac{E}{\rho}}$ d.$\frac{1}{t}\sqrt{\frac{\sigma E}{\rho}}$	K1	
	6	Identify the sound that produces pleasant effect in our ears--------. a. Breaking of a glass jar b. explosion of bomb c. Music d. thunder	K2	
4	7	The radii of the bright rings are proportional to the square root of ---------- a.Magic numbers b.natural numbers c.Quantum numbers d.integers	K1	
	8	Along a stretched wire a transverse wave passes with speed 3000 m/s. If the tension in the wire increased four times, then the velocity of the wave is a.1500m/s b.6000m/s c.3000m/s d. 9000m/s	K2	
5	9	The time required for one-half of any given quantity of the isotope to decay is called------ a. Mean life b. half life c. decay constant d. disintegration	K1	
	10	Which are the most dangerous radiation outside our bodies? a.Alpha an beta b. beta and gamma b.Alpha alone d. beta alone	K2	

SECTION - B (35 Marks)

Answer **ALL** questions

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

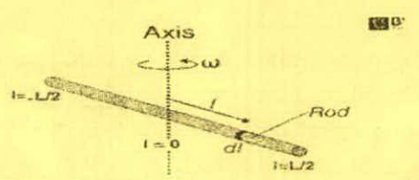
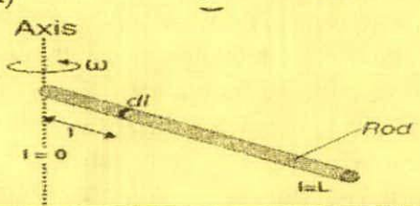
Module No.	Question No.	Question	K Level	CO
1	11.a.	Illustrate the theorems of parallel and perpendicular axes	K3	
		(OR)		
	11.b.	Show that the moment of inertia I of a circular disc about an axis through its centre and perpendicular to its plane is equal to (i) $\frac{1}{2}MR^2$ (ii)$\frac{5}{4}MR^2$ respectively.		

Cont...

2	12.a.	Obtain an expression for the depression at the free end of a thin light beam clamped horizontally at one end and loaded at the other. Describe an experiment to determine E by bending.	K3	
		(OR)		
	12.b.	A wire 2 m long and 2 mm in diameter, when stretched by weight of 8 kg has its length increased by 0.24 mm. Find the stress, strain and Young's modulus of the material of the wire. g = 9.8 m/s²		
3	13.a.	Apply Piezo electric effect and determine the velocity of the Ultrasonic wave produced by a piezo electric oscillator. The density of the quartz crystal is 2650 Kgm^{-3} and the Young's modulus of the quartz is 7.9 x 10^{-10} Nm^{-2}	K3	
		(OR)		
	13.b.	Discuss the applications of ultra sonics		
4	14.a.	Obtain the expression for achromatic aberration of two thin lenses in contact	K2	
		(OR)		
	14.b.	Distinguish between interference and diffraction		
5	15.a.	Discuss the fundamental laws of radioactivity	K3	
		(OR)		
	15.b.	Distinguish between the properties of Alpha, Beta and Gamma rays.		

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	Analyse axis of passing through the following picture and find the moment of inertia according to the same. (i)  (ii) 	K4	CO1
2	17	Discuss the different Elastic moduli of a cube which is applied with different forces P, Q and R also analyse the (i) the relation between Y,η,and σ (ii) the relation between K,Y and σ	K4	CO2
3	18	Develop Sabine formula for reverberation time	K4	C03
4	19	Determine the wavelength of light using Transmission Grating and discuss the theory of Plane diffraction grating	K4	C04
5	20	Explain the fission of Uranium 235 on the basis of liquid drop model and develop semi emphirical mass formula	K4	C05

Z-Z-Z END