

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMEBR 2024
(Second Semester)

Common to Branches - **MATHEMATICS & MATHEMATICS**
WITH COMPUTER APPLICATIONS
PHYSICS - II

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 restoring force in Simple Harmonic Motion is a) Proportional to the square of the displacement b) Proportional to the cube of the displacement c) Proportional to the displacement d) Does not depend on the displacement	K1	CO1
	2	Which of the following is an example of damped oscillation? a) A pendulum in vacuum b) A car suspension system c) A guitar string being plucked in air d) A child on a swing being pushed	K2	CO1
2	3	In an electromagnetic wave, the electric and magnetic fields are a) Parallel to each other and perpendicular to the direction of wave propagation b) Perpendicular to each other and parallel to the direction of wave propagation c) Parallel to each other and parallel to the direction of wave propagation d) Perpendicular to each other and perpendicular to the direction of wave propagation	K1	CO2
	4	Which property of a transverse wave is represented by the distance between two consecutive crests or troughs? a) Amplitude b) Frequency b) Wavelength d) Period	K2	CO2
3	5	Which principle allows light to propagate through an optical fiber? a) Reflection b) Refraction c) Total internal reflection d) Diffraction	K1	CO3
	6	The loss of optical power as light travels through a fiber is known as. a) Amplification b) Attenuation c) Dispersion d) Reflection	K2	CO3
4	7	Name the material commonly used in high temperature measurements. a) Copper b) Iron c) Platinum d) Aluminum	K1	CO4
	8	Which of the following effect is used in thermoelectric cooling system? a) Seebeck effect b) Peltier effect c) Thomson effect d) Joule effect	K2	CO4

Cont...

5	9	When a PN junction diode is forward biased, the depletion region a) Narrows b) Widens b) c) Remains the same d) Disappears	K1	CO5
	10	Varactor diodes are also known as. a) Zener diode b) Tunnel diode c) voltage variable resistors d) voltage variable capacitors	K2	CO5

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.	Define SHM. What are the characteristics of SHM?	K3	CO1
		(OR)		
	11.b.	Show that the oscillations of a simple pendulum are simple harmonic. Hence deduce the expression for time period.		
2	12.a.	Obtain the relation between μ and ϵ_r	K4	CO2
		(OR)		
	12.b.	Write the characteristic of impedance.		
3	13.a.	With a neat diagram describe the structure of an optical fiber. What do you mean by Numerical aperture?	K3	CO3
		(OR)		
	13.b.	Using block diagram discuss the basic elements of a fiber optical communication system.		
4	14.a.	Explain Thomson effect.	K3	CO4
		(OR)		
	14.b.	State and explain the two laws of thermoelectricity.		
5	15.a.	Explain the working of a Zener Diode.		
		(OR)		
	15.b.	Distinguish between Light Emitting Diode and Photodiode.		

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	Discuss the phenomenon of sharpness of resonance and show how it depends on the damping factor.	K4	CO1
2	17	Derive Maxwell's equation for electromagnetic waves in free space.	K4	CO2
3	18	Classify optical fibers based on their material, mode and refractive index profile.	K3	CO3
4	19	What is meant by Seebeck series? What is the significance of this arrangement? Explain how the thermo e.m.f. varies with temperature of the junctions of a thermo couple.	K4	CO4
5	20	Describe the construction of a PN junction diode and with the help of a circuit diagram explain the VI characteristics.	K4	CO5

Z-Z-Z END