

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2024
(Third Semester)

Branch: PHYSICS

PHOTONICS AND APPLICATIONS

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	What is the life time of atoms in ground state for stimulated absorption? a) 1s b) 1 minute c) 1 hour d) Infinity	K1	CO1
	2	Show the characteristics of laser beam. a) Highly directional b) Highly intense c) Highly monochromic d) All of them	K2	CO2
2	3	Which medium is suitable for Optical Pumping? a) Transparent to light b) Not transparent light c) Metallic d) Non metallic	K1	CO1
	4	Interpret the major role played by an optical resonator. a) Stimulating more and more atoms from excited state to ground state b) Generation of intense laser output c) Generation unidirectional beam of photons d) All of them	K2	CO2
3	5	List how Ruby lasers works? a) Non pulses mode due to the high pump energy b) Pulsed mode due to the high pump energy c) Pulsed mode due to the low pump energy d) Non pulse mode due to the low pump energy	K1	CO1
	6	Outline the main advantage of gas lasers. a) They can operate in the pulse mode b) They cannot be operate continuously c) They can operate continuously d) They cannot operate in the pulse mode	K2	CO2
4	7	Which characteristic of laser allows it to be used in holography? a) Coherence b) Directionality c) Intensity d) Mono chromaticity	K1	CO1
	8	Outline the purpose why Laser is used in LIDAR? a) High speed photography b) Range finder c) Optical carrier signal d) drilling	K2	CO2
5	9	What determines light intensity in a CRT? a) Voltage b) Current c) Momentum of Electrons d) Fluorescent screen	K1	CO1
	10	Relate the material for fabrication of an LED. a) Gallium arsenide b) Gallium arsenide phosphide c) Indium antimonite d) Indium antimonite phosphide	K2	CO2

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.	Explain the principle of laser action.	K2	CO2
		(OR)		
	11.b.	Interpret the conditions for laser oscillations.		
2	12.a.	Explain optical pumping.	K2	CO2
		(OR)		
	12.b.	Compare active and passive methods of mode locking.		
3	13.a.	Explain about Ruby laser.	K2	CO2
		(OR)		
	13.b.	Explain dye laser.		
4	14.a.	List out some application of LASER.	K4	CO3
		(OR)		
	14.b.	Analyze Inter ferrometric methods.		
5	15.a.	Examine Photoluminescence with a neat diagram.	K4	CO3
		(OR)		
	15.b.	Classify the Numeric displays.		

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	Distinguish absorption, spontaneous and stimulated emission with a neat diagram.	K4	CO3
2	17	Summarize three level and four level laser in detail.	K2	CO1
3	18	Interpret and Explain He-Ne laser with a neat diagram.	K2	CO5
4	19	Outline and Explain LIDAR in detail.	K2	CO2
5	20	Summarize Photoluminescence with a neat diagram.	K2	CO5

Z-Z-Z

END