A Reg. No. : | | | | | | | | | | |

Question Paper Code: 59505

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Elective

Electronics and Instrumentation Engineering

15UEI905 - OPTICAL AND LASER INSTRUMENTATION

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. In a laser structure, the existence of standing waves is possible at frequencies for which the distance between the mirrors is an integral number of _____ CO1 -R

   (a) . λ / 2 (b) λ / 4 (c) λ / 6 (d) . λ / 8

2. Which among the following is regarded as an inelastic scattering of a photon? CO1 -R

   (a) Kerr Effect (b) Raman Effect (c) Hall Effect (d) Miller Effect

3. Which is the correct order of sequential steps for an electric arc fusion technique? CO2- R
   A. Pressing of fiber ends for fusion
   B. Application of heat for smoothening of end-surfaces
   C. Alignment of broken fiber edges

   (a) A, B, C (b) B, A, C (c) C, B, A (d) C, A, B

4. Which of the following are not considered as environmental conditions required for field measurements? CO2- R

   (a) Temperature (b) Humidity (c) Mechanical load (d) Power

5. A fiber which is referred as non-dispersive shifted fiber is CO3- R

   (a) Coaxial cables (b) Standard single mode fibers

   (c) Standard multimode fibers (d) Non zero dispersion shifted fibers

6. The image produced by holography is CO3-R

(a) 1-dimensional (b) 2-dimensional (c) 3-dimensional (d) 4-dimensional

7. The small section of fiber which is coupled to the optical source is known as _____ CO4- R

(a) Flylead (b) Pigtail (c) Both a and b D. none of the above

8. In pyroelectric photo detectors, the consequent increase in dielectric constant due to temperature variation by the photon absorption, is generally measured as change in CO4- R

(a) resistance (b) inductance (c) admittance (d) capacitance

9. Solar cell works based on CO5- R

(a) Laser technology (b)Photo-conduction (c) Thermal emission (d) Tyndall effect

10. How many domains support the measurements of fiber dispersion? CO5- R

(a) One (b) Three (c) Two (d) Four

PART – B (5 x 2= 10Marks)

11. How will you increase the modulation bandwidth of laser diode? CO1- R

12. What is LIDAR? CO2- R

13. Write the uses of holography. CO3 -R

14. Define V number of fiber. CO4- R

15. List the two modes of laser melting process. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Describe in detail about Q – Switching and mode locking with neat diagram. CO1- App (16)

Or

(b) Explain in detail about Gas laser and Semi conductor laser with relevant diagram. CO1 -App (16)

17.	(a)	Describe in detail the principle of measurement of voltage and current usin laser.	CO2- App	(16)
		Or		
	(b)	Explain in detail about (i) Process of laser trimming (ii)Material removal and vaporization.	CO2 -Ana	(16)
18.	(a)	Explain in detail about methods of holographic interferometry.	CO3- Ana	(16)
		Or		
	(b)	Explain in detail about laser in plastic surgery and oncology.	CO3 -Ana	(16)
19.	(a)	Discuss the following (i) Absorption losses (ii) Scattering Losses	CO4 -U	(16)
		Or		
	(b)	Explain in detail about any two types of optical sensors and detectors with neat diagram.	CO4 -Ana	(16)
20.	(a)	Explain in detail about different types of modulators	CO5 -U	(16)
		Or		
	(b)	Describe in detail bout measurement of pressure and temperature using fiber optic sensor.	CO5- U	(16)