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Reg. No. :

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Question Paper Code: 59505

B.E. / B.Tech. DEGREE EXAMINATION, NOV 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. Laser Light is highly CO1 -R
(a) Mono chromatic (b) directional (c) coherent (d) none of these
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. _____ welding is done using pulse lasers or continuous wave laser beams with shutters. CO2- R
(a) Micro (b) Macro (c) Seam (d) Ultrasonic
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. _____ is used to reduce the amount of blood supply to a tumor by blocking the flow of blood in selected arteries during laser surgery. CO3-R
(a) Embolization (b) Endoscopy
(c) Stereotactic surgery (d) Photo dynamic surgery

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. _____ is used to measure the fibre attenuation along fiber optics link. CO5- R
 (a) Fiber sensor (b) Optical domain reflectors
 (c) Modulators (d) Interferometers

PART – B (5 x 2= 10Marks)

11. List the different types of laser sources based on the active medium. CO1- R
12. What is LIDAR? CO2- R
13. What are the different ways in which Laser interacts with tissues in laser surgery? CO3 -R
14. Define V number of fiber. CO4- R
15. Describe the requirements of light source used for communication CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Discuss the Q switching and Mode locking techniques with neat sketch 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 laser welding and melting. CO2- App (16)
- Or
- (b) Explain in detail about (i) Process of laser trimming CO2 -Ana (16)
 (ii) Material removal and vaporization.

18. (a) Illustrate the importance of laser based surgery in removal of tumors in vocal cords. . CO3- Ana (16)
- Or
- (b) Explain in detail about laser in plastic surgery and oncology. CO3 -Ana (16)
19. (a) Discuss the following CO4 -U (16)
- (i) Absorption losses
- (ii) Scattering Losses
- Or
- (b) What is meant by splicing? With neat diagram explain the different splicing technique. CO4 -Ana (16)
20. (a) Describe the special features of fibre optic sensors and explain any two industrial applications of fibre optic sensors CO5 -U (16)
- Or
- (b) Describe in detail about measurement of pressure and temperature using fiber optic sensor. CO5- U (16)

