

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code: S31681**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Elective

Instrumentation and Control Engineering

01UIC909 - FIBRE OPTICS AND LASER INSTRUMENTS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is bandwidth and wavelength?
2. Define Snell's law of refraction.
3. What is Acoustic optic modulator?
4. Write the advantage of fiber optic sensor.
5. List the difference between active and passive mode locking.
6. What is beam divergence?
7. Define Doppler effect.
8. Give the applications of lasers in industry.
9. Write the effect of photo thermal process in tissues.
10. Mention the name of the laser used in medical field.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain step and graded index fiber. (8)
- (ii) Explain the characteristics of optical sources and detectors. (8)

Or

- (b) (i) Differentiate fiber optic connectors from splicers. Explain the differences with neat sketches. (8)
- (ii) What are linear and nonlinear scattering? Explain in detail with examples. (8)
12. (a) (i) Explain different types of modulators used in fiber optic instrumentation system. (8)
- (ii) Describe the principle of measurement of length with neat diagram. (8)
- Or
- (b) (i) What are the different types of fiber optic sensors? Explain them. (8)
- (ii) Describe the principle of measurement of strain with neat diagram. (8)
13. (a) Discuss on the characteristics of Lasers. With help of diagrams explain the principle of three levels and level Lasers. (16)
- Or
- (b) Explain about the following: (i) Q switching (ii) Mode hopping and mode drift (iii) Cavity damping in lasers. (16)
14. (a) Explain how laser is used for the measurement of distance, velocity and voltage. (16)
- Or
- (b) Explain the industrial application of LASER in material processing. (16)
15. (a) (i) Explain the basic principle of Holography with neat diagrams. (8)
- (ii) Explain the medical applications of laser in gynecology and oncology. (8)
- Or
- (b) (i) Explain the advantages and potential applications of Holography. (8)
- (ii) Describe the LASER instruments for surgery and removal of tumors of vocal cards (8)
-