**OR**

4. a) Explain Q-switching technique for pulse generation. Compare mode locking and Q-switching techniques   6

   b) Describe the structure, characteristics and applications of PIN and APD detectors   6

### UNIT-III

5. a) Explain basic detection principles of fiber optic sensing   6

   b) Describe the most common forms of semiconductor detector devices   6

**OR**

6. a) What is meant by Moire fringe? Explain   6

   b) Explain the principle and working of liquid level measuring optic sensor   6

### UNIT-IV

7. a) Explain how LASER is used for measuring current and voltage   6

   b) Describe how LASER is useful in studying atmospheric pollution   6

**OR**

8. a) Describe about fiber optic current transducers   6

   b) Write short notes on:
     i) Measurement of atmospheric effects
     ii) Laser heating   6

### UNIT-V

9. a) Explain the principle and working of Hologram   6

   b) Explain how holography is used for non-destructive testing   6

**OR**

10. a) Discuss various practical aspects of Holography   6

    b) Explain double-exposure holographic inter ferometry   6

**[EPREI-232]**
# M.Tech. Degree Examination

## Electronic Instrumentation
## II SEMESTER

### OPTO-ELECTRONIC INSTRUMENTATION
(Effective from the admitted batch 2014–15)

Time: 3 Hours                Max.Marks: 60

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**Instructions:**   Each Unit carries 12 marks.
                Answer all units choosing one question from each unit.
                All parts of the unit must be answered in one place only.
                Figures in the right hand margin indicate marks allotted.

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### UNIT-I

1. a) Discuss in detail material absorption losses in silica glass fibers   6

   b) When a mean optical power launched into 10 km length of fiber is 100W the mean optical power at the fiber output is 2W.
     i) Determine the overall signal attenuation
     ii) The overall signal attenuation for a 12 km optical link using the same fiber with splices at 1 km intervals, each giving an attenuation of 1 dB   6

**OR**

2. a) Explain how mode coupling causes loss. Derive the necessary expression   6

   b) A step index multimode fiber has a core index of 1.5000 and a cladding index of 1.49800. Find
     i) Intermodal dispersion factor for the fiber
     ii) The total dispersion in an 18-km length and
     iii) The max bit rate allowed, assuming dispersion limiting   6

### UNIT-II

3. a) Compare the relative advantages and disadvantages of LED and Laser diodes   6

   b) For a LED, compute the fraction of injected charges which produce photons if 2 mW of optical power are radiated with a drive current of 50 mA at 1.3 m   6

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