

B.E. Instrumentation Engineering (Model Curriculum) Semester-IV  
**IN401 - Fundamentals of Optical Communication**

P. Pages : 2

Time : Three Hours



**GUG/W/23/14014**

Max. Marks : 80

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- Notes :
1. All questions carry marks as indicated.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.
  4. Retain the construction lines.

1. a) Describe the frequency modulation with its mathematical general expression. **8**
- b) A sinusoidal modulating waveform of amplitude 5V and a frequency of 2 kHz is applied to FM generator, which has a frequency sensitivity of 40 Hz/volt. Calculate the frequency deviation, modulation index, and bandwidth. **8**

**OR**

2. a) Describe the block diagram of phase discrimination method of FM demodulator. **8**
- b) Elaborate the working operation of square law demodulator. **8**
3. a) Describe the function of each block of Tuned Radio Frequency receiver. **8**
- b) Elaborate the characteristics of radio receiver. **8**

**OR**

4. a) Explain the principle of Differential Pulse Code Modulation. **8**
- b) Describe the features of Delta Modulation **8**
5. a) Explain the relationship between irradiance and input power. **8**
- b) Elaborate the construction and working of LCD. **8**

**OR**

6. a) Discuss the basic steps required to form the laser beam. **8**
- b) Elaborate the construction of Ruby laser with energy level diagram. **8**
7. a) Name the basic principle of light propagation in optical fiber. Explain in detail. **8**
- b) Describe the step index and graded index fiber in detail. **8**

**OR**

8. a) Discuss the losses occurred in optical fibers. **8**
- b) Classify and describe the dispersion of optical fibers. **8**
9. a) Describe the fiber optical technique for the measurement of pressure. **8**
- b) Explain opto-electrical transducer and its types. **8**

**OR**

10. a) Elaborate the design concept of optical power meter. **8**
- b) Describe the fiber optical technique for the measurement of flow. **8**

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