

N.B. : (1) Question No. 1 is **compulsory**.

(2) Answer any **four** questions out of remaining **six** questions.

1. Answer the following in brief :-

- (a) Discuss the basic block diagram of optical communication system. 5
- (b) What are direct and indirect semiconductors ? Which types are suitable to be used as optical sources and detectors. 5
- (c) How does the optical signal propagate through the GIF. 5
- (d) What is the difference between coherent and non-coherent optical transmission ? 5

2. (a) Explain the 'Different Modes' that can be supported by an optical fiber. 10  
 (b) Using simple ray theory concept, discuss the transmission of light through single mode fiber. What is the major advantage of this type of fiber ? 10

3. (a) 'Optical signal distortion limits the information carrying capacity of the fiber' Justify 10 the comment.  
 (b) List the important factors responsible for power loss in optical fiber. Explain each 10 factor briefly.

4. (a) What are the general requirements of a good optical source ? Describe the 10 technique used to give both electrical and optical confinement in injection lasers.  
 (b) Draw the structure of APD alongwith electrical field profile that exist in the various 10 regions. Explain its working and also explain why it is also called RAPD.

5. (a) Describe two methods of splicing individual fibers together. What are some 10 advantages and disadvantages of each method ?  
 (b) Discuss a popular non-destructive technique for attenuation measurement. 10

6. Describe three methods of preform fabrication. Include starting materials, heat sources, 20 fabrication temperatures used and the technique used to make the preform for each method.

7. Write short notes on any **four** :—

- (a) Rise time budget
- (b) Measurement of dispersion
- (c) Radiative losses in optical fiber.
- (d) PIN diode
- (e) Double heterogenous LED.