M.Tech. Electronics & Communication Engineering (CBCS Pattern) Semester - II

PECS22 - Advanced Optical Communication Paper-II

P. Pages : 1 **GUG/S/23/11031**

Time : Three Hours * 1 2 6 0 * Max. Marks : 70

Notes : 1. All questions carry marks as indicated.
2. Answer **any five** questions.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain the concept and step involve in optical fiber link design. **7**

b) Discuss the major trends in the development of optical fiber communication. **7**

2. a) Define external quantum efficiency. Explain the operation of an edge emitting LED. **7**

b) What are the different types of lasers used in optical communication? **7**

3. a) Derive the expression for lasing condition and resonant frequencies in laser. **7**

b) Explain the operation of silicon p-i-n photodiode. **7**

4. a) The quantum efficiency of a particular silicon RAPD is 80% for detection of radiation at a wavelength of $0.02\mu m$. When the incident optical power is $0.5\mu W$, the output current from the device (After avalanche gain) is $12\mu A$. Determine the multiplication factor of photodiode under these conditions. **7**

b) A surface emitting LED launches $140\mu m$ of optical power into a multimode step index fiber calculate the overall power conversion efficiency If the 25 mA forward current is flowing in the device and corresponding forward voltage across the diode is 2.5V. **7**

5. a) Explain the operation of optical time domain Reflectometry (OTDR). **7**

b) Explain the principle of working of EDFA. **7**

6. a) Compare WDM and DWDM. **7**

b) Explain GPON applications of optical amplifier. **7**

7. a) Compare RF LAN and IR LAN. **7**

b) Explain the difference between passive and active fiber optical couplers. **7**

8. Write short notes on **any two**. **14**

a) Dense WDM. b) Noises in optical communication.

c) Optical Isolator.

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