

M.Sc. F.Y. (Physics) (NEP Pattern) Semester-II
02MSCPH4-1 - Advanced Optoelectronics

P. Pages : 2

Time : Three Hours



GUG/W/24/15418

Max. Marks : 80

Either:

1. a) What is fiber optics ? Explain the basic principle and construction of fiber optics cable. 8
- b) Discuss the step index and graded index fibers in detail. 8

OR

- e) Define : 8
- i) Acceptance angle and obtain an equation for acceptance angle.
- ii) Numerical aperture and obtain an equation for numerical aperture.
- f) With suitable diagram explain principle, construction and working of optical fiber. 8

Either :

2. a) What is Luminescence ? Compare direct and indirect band gaps materials. 8
- b) Explain construction and working of LED. Explain emission properties and efficiency of LED. 8

OR

- e) Explain the semiconductor LASER. State different types of semiconductor LASERs. 8
- f) State principle; explain construction and the operation of photo-detector. 8

Either :

3. a) What is line width and band width of the laser ? Explain transverse and longitudinal mode selection in LASER. 8
- b) Write notes on electro-optic and acousto-optic devices. 8

OR

- e) What is mode locking in lasers ? Give theory on mode locking in lasers. 8
- f) Discuss in detail types of photo detector. 8

Either :

4. a) What is A/D and D/A conversion? Give the construction and working of A/D converter. 8
- b) Write notes on NRZ, RZ and Manchester coding. 8

OR

- e) What is a Fiber optic sensor ? Explain phase and polarization fiber sensors. 8
- f) Explain Intrinsic sensors and Extrinsic fiber sensors. 8

5. Attempt **all** the followings.

- a) Write a short note dispersion shifted and dispersion flattened fiber. 4
- b) State important properties and applications of photodetectors. 4
- c) Explain the properties of Lasers with respect to directionality and coherence. 4
- d) Write construction and working of Gyroscope. State its applications. 4
