

2016**M.Sc.****3rd Semester Examination****ELECTRONICS****PAPER—ELC-304***Full Marks : 50**Time : 2 Hours**The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.***(Optical Communication and Information Processing)**

Answer Q. No. 1 and any three questions from the rest.

1. (a) Why WDM is advantageous over other types of multiplexing ?
- (b) What do you mean by Spatial Light Modulator (SLM) ?

(Turn Over)

- (c) What are the materials used for making LEDs and LASERS? Also, explain the reasons for using these materials.
- (d) What do you mean by Evanescent field?
- (e) What do you mean by the mode in optical fiber?

2×5

2. (a) Explain with example the NRZ, RZ and Manchester code.
- (b) What is Time Division Multiplexing (TDM)? Discuss the synchronous and asynchronous TDM. (2+2+2)+(2+2)
3. (a) Discuss the working principle of LED with band diagram. What should have the specialities of good LED materials?
- (b) The power generated internally within a double-heterojunction LED is 28.4 mW at a drive current of 60 mA. Determine the peak emission wavelength from the device when the radiative and nonradiative recombination lifetimes of the minority carriers in the active region are equal. (5+2)+3
4. (a) What are microbendings and macrobendings? How they introduce loss of light energy in optical fiber?

- (b) How do you detect submerged bodies with laser ?
(2+2+2)+4
5. (a) Explain the terms, Absorption, Spontaneous emission and stimulated emission in connection of LASER.
- (b) Discuss the Absorptive losses and Radiative losses in an optical fiber.
(2+2+2)+(2+2)
6. What are the advantages of optical logic gates over electronic gates ? Design and explain the operation of an optical EX-OR gate. Hence construct of half-adder by using an optical EX-OR gate and optical AND gate. 2+4+4

(Internal Assessment : 10 Marks)
