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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Fifth Semester, B.E. - Electronics and Communication Engineering
Semester End Examination; Dec - 2016/Jan - 2017
Optical Communication System

Time: 3 hrs   *Max. Marks: 100*

Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.
     ii) Assume missing data, if any, suitably

UNIT - I

1 a. Compare multimode fibers types with respect to construction and performance.   6

  b. Explain Vapour Axial Deposition (VAD) with a suitable diagram.   6

  c. Consider a step index fiber having refractive index of core 1.5 and cladding 1.44, operating wavelength 1.50 μm. Determine core radius, NA and maximum acceptance angle.   8

2 a. Derive an expression for N.A. of a graded index fiber.   6

  b. Sketch the schematic diagram of a fiber drawing apparatus used in fiber fabrication and explain.   8

  c. A manufacturer wishes to make a silica core S1 fiber with N.A. = 0.3, V = 75 to be used at 850 nm, if n_1 = 1.5, what should be the core size and cladding index to be?   6

UNIT - II

3 a. Explain working of LED with a suitable diagram.   6

  b. Discuss different lensing schemes to improve coupling.   7

  c. Describe any one method of splicing.   7

4 a. Explain laser diode with a diagram.   6

  b. Describe non imaging microsphere.   7

  c. Consider a GaAs source with index 4.6 is coupled to silica fiber having index of 1.14. If fiber end and source are in close contact, calculate Fresnel reflection at interface and power loss in dB.   7

UNIT - III

5 a. Explain Avalanche Photo diode with a diagram.   8

  b. Discuss noise sources in the detector.   6

  c. For a wavelength range 1300 nm < λ < 1600 nm, the quantum efficiency of 90%, calculate responsivity and cutoff wavelength.   6

6. a. Draw the schematic diagram of a typical receiver.   8

  b. List the benefits of a transimpedance amplifier.   6

  c. What is eye pattern? Illustrate with an example.   6

UNIT - IV

7 a. With a block diagram, illustrate simplex point to point link.   10

  b. Implement a typical WDM network containing various types of optical amplifiers.   10

8 a. Illustrate FDM of *N* independent information bearing signal.   10

  b. Draw the cross sectional view of fused fiber coupler with coupling and tapered regions. Explain.   10

UNIT - V

9 a. Discuss three types of optical amplifiers.   6

  b. Describe semiconductor optical and doped fiber amplifiers.   8

  c. Explain EDFA architecture.   6

10 a. Explain BLSR architecture with a diagram.   10

  b. Illustrate different SDH frames and SONET frames.   10

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