Code: 9A04702

R09

B.Tech IV Year I Semester (R09) Supplementary Examinations, May 2013

OPTICAL COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1. (a) Discuss the advantages of optical fibers over conventional coaxial cables.
   (b) Discuss the mode theory of circular waveguide.

2. List out the requirements for selecting materials in optical fibers and also explain about the following :
   (a) Halid glass fibers.
   (b) Active glass fibers.
   (c) Plastic glass fibers.

3. (a) Explain about intrinsic and extrinsic absorption exists in optical fibers.
   (b) Explain about the following:
   (i) Material dispersion. (ii) Wave guide dispersion.

4. (a) Explain clearly about the mechanical misalignments.
   (b) Explain about fiber splicing.

5. (a) Explain different structure of lasers with neat sketches.
   (b) Explain the surface emitters and edge emitter LEDS.

6. (a) Explain about avalanche photo diode.
   (b) A photo diode has quantum efficiency of 65 %. When photons of energy 1.5 x 10^{-19} J are incident on it? (i) What is the wave length of the photo diode? (ii) Calculate the incident optical power required to obtain a photo current of 2.5 μA, when the photo diode is operating as described above.

7. (a) Derive an expression for carrier to noise ratio of analog link.
   (b) Explain about multi channel transmission techniques.

8. (a) Explain about broad cast and select WDM networks in detail.
   (b) Explain about the following:
   (i) Passive optical couplers. (ii) Active optical components.

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