

C 28934

Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE  
EXAMINATION, JUNE 2012

EC 04 703—OPTICAL COMMUNICATION SYSTEMS

Time : Three Hours

Maximum : 100 Marks



Answer all questions.

1. (a) Explain about dispersion in single mode and multimode fibres.  
(b) What is meant by linearly polarized and circularly polarized wave ?  
(c) Explain the operation and features of LED.  
(d) What is meant by sensitivity and quantum efficiency.  
(e) Explain the performance of  $P_e$  with respect to detected photons per bit for PSK system.  
(f) Draw and explain the structure of single branch heterodyne receiver.  
(g) Comment on the different types of optical amplifier gain characteristic based around  $1.5 \mu\text{m}$ .  
(h) Explain about intermodulation products.  

(8 × 5 = 40 marks)
2. (a) Derive the solution to Maxwell equation for a circularly symmetric step index optical fiber.  

Or

(b) Describe briefly about attenuation and dispersion characteristics of optical fibers.
3. (a) Explain the operation of a semiconductor laser and comment on its efficiency and strip geometry.  

Or

(b) Discuss the operation of avalanche photodiode and comment on energy band current gain and receiver sensitivity characteristics of this diode.
4. (a) Describe in detail about performance degradation induced by nonlinear effects.  

Or

(b) Discuss the performance of IM-DP systems.
5. (a) Discuss about any two types of SLA types and indicate their distinguishing features.  

Or

(b) Explain the gain process in a Raman fiber amplifier and comment upon the flexibility associated with the pumping process in this amplifier type.  

(4 × 15 = 60 marks)