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Question Paper Code:U2204

M.E. DEGREE EXAMINATION, APRIL / MAY 2025

Second Semester

Communication Systems

21PCM204- FIBRE OPTIC NETWORKS

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1. (a) Describe the roles of various optical components used in a fiber optic communication system. How do these components contribute to the overall system performance? CO1- U (20)
Or
(b) What is the role of wavelength converters in a fiber optic communication system, and how do they enhance network performance? CO1- U (20)
2. (a) Analyze the two categories of nonlinearities in fiber optic networks and justify the suitable network for optical fiber communication. CO4-Ana (20)
Or
(b) Analyze the Spectrum of a baseband signal compared with the spectra of double sideband (DSB) and single sideband (SSB) modulated signals. CO4-Ana (20)
3. (a) Design a suitable OTN to transport data packet traffic over fiber optics in underwater optical communication CO3- App (20)
Or
(b) How would you design a client layer in an optical network to support telephonic communication? Apply appropriate principles and justify your design choices. CO3- App (20)
4. (a) Analyze the effects of performance and fault management while providing services to the different service providers in optical communication CO4- Ana (20)

Or

- (b) Evaluate the cost trade-offs involved in designing optical networks using different light path topologies to handle the same traffic demand. How does the choice of topology influence overall network efficiency and expenditure? CO4- Ana (20)

5. (a) Compare and contrast the performance of a Nonlinear Optical Loop Mirror (NOLM) and a Nonlinear Amplifying Loop Mirror (NALM) in optical transmission systems. Provide a justification for their performance differences. CO5-Ana (20)

Or

- (b) Analyze the performance of twisted-pair telephone access network and the hybrid fiber coax cable television network which then distributes it to individual subscribers via coaxial cable drops. CO5-Ana (20)