Q.P. Code :25165

[Time: Three Hours]   [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Question 1 is compulsory.
        2. Attempt any 3 questions out of remaining five questions.
        3. All questions carry equal marks.
        4. Assume suitable data wherever necessary, with proper justification.

Q.1   Attempt any four.

        a) Define attenuation wrt optical communication. What are its different types.   05

        b) Derive the expression for Numerical Aperature. Hence find the numerical aperature of   05
            optical fiber if R.I of core is 1.48 and RI of cladding is 1.46

        c) Compare between spontaneous and stimulated emission.   05

        d) Define line, path and section wrt SONET.   05

        e) Write the application of   (i) optical multiplexer   (ii) Optical repeater.   05

Q.2   a) Explain Resonant Cavity Enhanced (RCE) photo detector in detail.   10

        b) Calculate the carrier frequency and energy in eV for optical communication system   10
            operating at wavelength of $0.85\mu m$ and $1.3\mu m$. Velocity of light is assumed to be
            3×10^8 m/s.

Q.3   a) Explain EDFA optical amplifier.   10

        b) Draw the connection matrix for 16-channel WADM for following   10
            i)   Channel 5-12 are through
            ii)   Channel 1-4 are added
            iii)   Channel 13-16 are dopped

Q.4   a) Explain First passage model and blocking model for statistical wavelength routing   10
            network.

        b) Write short note on detailed Ring Network.   10

Q.5   a) What is Optical Transport Network (OTN)? Explain OTN frame structure in detail.   10

        b)Explain the rationale for selecting 51.84 Mbps data for SONET. Mention merits and   10
          demerits of SONET.

Q.6   Write short note on-

        a) Optical MEMS   10
        b) Optical Switch   10

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