[Time: Three Hours]

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 optical fiber if R.I of core is 1.48 and RI of cladding is 1.46	05
	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 operating at wavelength of $0.85\mu m$ and $1.3\mu m$. Velocity of light is assumed to be $3 \times 10^8 m/s$.	10
Q.3	a) Explain EDFA optical amplifier.	10
	 b) Draw the connection matrix for 16-channel WADM for following i) Channel 5-12 are through ii) Channel 1-4 are added iii) Channel 13-16 are dopped 	10
Q.4	a) Explain First passage model and blocking model for statistical wavelength routing network.	10
	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 demerits of SONET.	10
Q.6	Write short note on-	
	a) Optical MEMSb) Optical Switch	10 10