BE – VII – ETRX – CBSGS.
Optical Fibre Communication.
Dec- 2015

17/12/15

QP Code : 6151

(3 Hours)   [Total marks : 80]

N.B.
1) Question No-1 is Compulsory.
2) Attempt any Three (03) Questions from remaining Five (05) Questions.
3) Assume suitable data where ever necessary.

Q. No.		Marks.
Q.1	Attempt the following Questions(any4)	
	a) What are the advantages of optical fiber communication?	5
	b) Compare step Index Fiber and graded index fiber?	5
	c) What do you understand by double heterostructure? State its limitations	5
	d) Explain the different types of losses in optical fiber communication	5
	e) What is Optical Transport network (OTN)	5
	f) Define Bandwidth Distance Product	5
Q.2(a)	Explain any one of the fiber fabrication process with neat diagram ,Compare the different methods of fabrication	8
Q.2(b)	A silica optical fiber with core diameter large enough to be considered by ray theory has a core refractive index of 1.5 and cladding refractive index of 1.47 Determine –(i)The critical angle (ii)The NA (iii)The Acceptance Angle	6
Q.2(c)	Explain a the application of Optical Amplifiers, for the EDFA give details Architecture with possible configurations and power conversion efficiency and gain	6
Q.3(a)	Explain the different types of losses in optical fiber communication ,Give the various factors responsible for optical signal attenuation &Dispersion	8
Q.3(b)	Compare the electrical and optical bandwidth for an optical fiber communication system and develop relationship between them	6
Q.3(c)	Name five connectors used in optical fiber communication, State the difference between couplers and connectors	6
Q.4(a)	Define the quantum efficiency and responsivity of photo detector, Derive the expression for responsivity of intrinsic photo detector in terms of quantum efficiency of the device and wavelength of the incident radiation, Determine the wavelength at which the quantum efficiency and responsivity are equal.	8
Q.4(b)	Explain with block schematic of optical fiber soliton transmission system with optical soliton pulses (i)collision of two solitons (ii)Four stable solitons at safe separation distance.	6
Q.4(c)	Difference between following term in context with optical communication(i)Optical Source &Optical Detector (ii)Coherent and Non coherent optical transmission	6
Q.5(a)	Describe the structure and operation of OTDR with illustration of possible back scatter plot from a fiber under test.	8
Q.5(b)	Explain the term protocol and Internet protocol(IP),using OSI reference model discuss implementation aspect of the (i)SONET(ii)DWDM	6
Q.5(c)	Explain with components a typical WDM link and some performance measurement parameter of user interest	6
Q.6	Write short note on(any4):	20
	(a) Optical Coupler and Application	
	(b)Nearest Neighbor & Long Distance Link power Budget	
	(c)Optical safety &Service Interface	
	(d)Optical Switches	
	(e)Structures for InGaAS APDs	

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