Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: EC405

Course Name: OPTICAL COMMUNICATION

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) How we can classify optical fibers in accordance with refractive index profile? Explain with neat diagrams. (5)

b) What are photonic crystal fibers? Explain the classification of PCF with neat diagrams. (10)

2 a) Compare spontaneous emission and stimulated emission of LASER. (5)

b) Explain the different types of scattering losses. (10)

3 a) What is Amplifier Spontaneous Emission Noise? (5)

b) What is dispersion? Explain the different types of dispersion .Why single mode fiber are used in commercial communication systems? (10)

PART B

Answer any two full questions, each carries 15 marks.

4 a) With the help of necessary figures, describe the working of an IMDD system. (5)

b) Explain the construction and avalanche multiplication of APD with neat diagram and outline the advantages and disadvantages as a detector for optical fibre communications. (10)

5 a) Write the concept of link power budget and rise - time budget. (5)

b) Design an optical fiber link for transmitting 15Mb/s of data for distance of 4 km with BER of 10^{-9}. Assume typical values. (10)

6 a) Compare quantum efficiency and responsivity of pin diode. (5)

b) Write the basic concept of solition generation, and also write the advantages of soliton based communication system. (10)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	What are optical Amplifiers? Explain the Woking any two with neat diagrams.	(8)
	b)	What are the advantages of SOA over EDFA?	(5)
	c)	What is a grating? A plain transmission grating posses 5000 rulings /cm. What is the angle of second order diffraction produced by the grating for a wave length of 1550 nm?	(7)
8	a)	What is a tunable optical filter?	(5)
	b)	Explain the working principle of OTDR. How refractive index is calculated using it?	(10)
	c)	Explain the principle of Raman Amplifier. What are the advantages and disadvantages of Raman amplifier?	(5)
9	a)	Explain add/drop multiplexers.	(6)
	b)	Explain the working of EDFA with necessary diagrams.	(8)
	c)	With block diagram explain free space optical communication system. Write the advantages and disadvantages of the system.	(6)

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