TED (21) – 5043A
(REVISION-2021)

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Reg.No……
Signature…….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER - 2023

OPTICAL COMMUNICATION AND NETWORKING

[Maximum Marks:75] [Time: 3 Hours]

PART - A

I. Answer all the following questions in one word or one sentence. Each question carries 'one' marks.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1	Calculate speed of light in ice, if refractive of ice is 1.31	M1.01	A
2	List the conditions required to be satisfied for total internal reflection to take place	M1.01	R
3	List the two optical sources used in communication system	M2.01	R
4	Name the photo detector which provides gain	M2.03	R
5	LASER diode emits light by the process of …… emission of radiation.	M2.01	R
6	State the function of pump laser in EDFA	M3.01	R
7	List types of dispersion losses in optical fiber	M3.02	R
8	State the expansion of SONET	M4.04	R
9	List any two types of fiber couplers	M4.02	R

PART - B

II. Answer *any eight* questions from the following. Each question carries 'Three' marks.

(8 x 3 = 24 Marks)

		Module Outcome	Cognitive level
1	List three advantages and three applications of optical fiber.	M1.03	R
2	Light travels from medium1 to medium2. The angle of incidence and angle of refraction are 40º and 27º respectively. Calculate refractive index of medium2 with respect to medium1.	M1.01	A

3	Define acceptance angle of fiber and state its significance.	M102	R
4	Draw and explain the structure of optical fiber.	M1.01	U
5	Draw the structure of PIN diode. State the necessity of intrinsic layer.	M2.03	R
6	Explain the significance of WDM technique in Optical Communication system.	M3.04	U
7	Draw and explain the working of SOA.	M3.01	U
8	Explain the scattering losses in fiber.	M3.02	U
9	Draw the block diagram of optical transceiver.	M3.03	R
10	Explain the function of optical isolator.	M4.02	U

PART - C

Answer all the questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III	Explain various fiber types based on refractive index profile and transmission mode.	M1.03	U
	OR		
IV	Calculate the Numerical aperture, acceptance angle and critical angle of the fiber from the following data: refractive index of core is 1.50, refractive index of cladding is 1.45	M1.02	U
V	Explain the principle of photo detection with diagram	M2.03	U
	OR		
VI	Illustrate the processes absorption, spontaneous emission and stimulated emission with figure.	M2.01	U
VII	List the comparison between PIN and Avalanche photo diode	M2.04	U
	OR		
VIII	Draw and explain the construction of edge emitting LED	M2.02	U
IX	Draw and explain the block diagram of optical communication system.	M3.03	U
	OR		
X	Explain the working of EDFA with diagram	M3.01	U
XI	Explain the functions of splices, beam splitters and optical modulators	M4.02	U
	OR		
XII	Explain the function of Optical circulator with figure.	M4.02	U
XIII	Explain Broadcast and select network with diagram	M4.04	U
	OR		
XIV	Illustrate the working of Directional coupler with figure	M4.02	U

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