Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U7402

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Seventh Semester

Electronics and Communication Engineering

21UEC702-OPTICAL AND MICROWAVE COMMUNICATION

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

PART A - (5 x 1 = 5 Marks)

1. The most common light used in fiber-optic links is — CO1-U

   (a) Infrared (b) Red (c) Violet (d) Ultraviolet

2. Which splicing technique involves the alignment and locking of broken fiber edges by means of positioning devices & optical cement? — CO1 - U

   (a) Fusion (b) Mechanical

   (c) Both (a) and (b) (d) None of the above

3. A device used for coupling microwave energy is known as — CO1 - U

   (a) Transmitter (b) Resonator (c) Waveguide (d) Loop

4. ____is an important consideration for hybrid MIC. — CO1 - U

   (a) Material Selection (b) Processing Unit

   (c) Design Complexity (d) Active Source

5. ____is a key component in the scalar or vector network analyzer. — CO1 - U

   (a) Reflect meter (b) Radiometer

   (c) Frequency meter (d) None of the above

PART – B (5 x 3= 15 Marks)

6. A step index fiber in air has a numerical aperture of 0.22 calculate the acceptance angle in air for skew rays that change direction by 110^0 at each reflection. — CO2-App
7. Define Bending loss and its types. — CO1-U
8. State the characteristics of magnetron and of 2-cavity klystron amplifier. — CO1-U

9.		Differentiate MMIC and conventional ICs.	CO1-U	
10.		Mention the drawbacks in calorimetric measurements.	CO1-U	

PART – C (5 x 16= 80 Marks)

11.	(a)	Describe in detail about the ray theory of a fiber with a special mention about TIR, Critical angle and Numerical Aperture.	CO1-U	(16)
		Or		
	(b)	Explain the features of multimode and single mode step index fiber and compare them.	CO1-U	(16)
12.	(a)	Illustrate the attenuation losses in optical communication system and explain	CO1-U	(16)
		Or		
	(b)	Describe the material absorption losses in optical fiber system.	CO1-U	(16)
13.	(a)	Determine the working of Probe coupling and how the position of probe is dependent on coupling. Draw the diagram of H – Plane Tee and explain the working.	CO1-U	(16)
		Or		
	(b)	Is it possible to match all the 3 ports of a lossless reciprocal microwave component? Prove the same.	CO1-U	(16)
14.	(a)	Explain the different types of materials used in MMIC and list their characteristics.	CO1-U	(16)
		Or		
	(b)	Describe in detail about the various conductive materials used in Monolithic microwave integrated circuit and explanation its application.	CO1-U	(16)
15.	(a)	Explain in detail with block diagram about the measurement of VSWR through return loss measurement, Justify the suitable measurement technique.	CO1-U	(16)
		Or		
	(b)	Summarize in detail how power is measured at microwave frequencies.	CO1-U	(16)