

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2173904****Date: 29/11/2018****Subject Name: Photonics****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define Photobiology and give its application	03
	(b) Explain the working mechanism of photoexcitation	04
	(c) Explain how lasers interact with the Biomolecules, cells and tissues.	07
Q.2	(a) Define Plasmon and how they are generated	03
	(b) Define the following terminologies	04
	(1) Current density	
	(2) Electromotive force	
	(3) Motional EMF	
	(c) Classify the type of laser and give the application of laser in various fields	07
	OR	
Q.3	(c) Write a note on manufacturing optical fibre.	07
	(a) What is $E-k$ diagram what does it signifies?	03
	(b) Give the various applications of the optoelectronic devices.	04
	(c) Write a note on working of LED's	07
	OR	
Q.3	(a) Explain the phenomena of the band to band and band to exciton phenomena occurring in electrons.	03
	(b) Give the various applications of optoelectronic tweezers.	04
	(c) Explain the working of Laser diodes and Quantum Well Lasers.	07
Q.4	(a) Define photonic crystal and give its application.	03
	(b) What is luminescence and explain any 4 types of luminescence,	04
	(c) Write a note on various methods developed to fabricate photonic crystals.	07
	OR	
Q.4	(a) Define Photovoltaic mode and photoconductive mode.	03
	(b) Explain the working mechanism of Avalanche Photodiodes.	04
	(c) Write a note on principle, working and application of OLED's and Quantum dot LED.	07
Q.5	(a) Enlist some of the commons near-field spectroscopy techniques and explain any two of them.	03
	(b) Give the advantages and disadvantages of Phototransistor.	04
	(c) Explain the principle and working of Near-Field Spectroscopy	07
	OR	
Q.5	(a) What is the difference between 3 leads and 2 leads phototransistor?	03
	(b) Explain the process occurring in the basic operation of Charge couple device.	04
	(c) Explain the phenomena of adiabatic nanofabrication and non-adiabatic nanofabrication of the devices.	07
