## **C.U.SHAH UNIVERSITY**

## **Summer Examination-2019**

**Subject Name: Applied Physics** 

Subject Code: 4TE02APH1 Branch: B.Tech (All)

Semester:2 Date: 30/04/2019 Time: 02:30 To 05:30 Marks: 70

**Instructions:** 

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

## Q-1 Attempt the following questions:

(14)

- a) Draw the Symbol of ordinary PN Junction Diode.
- **b**) Avalanche phenomena is present in \_\_\_\_\_.
  - (1) Ordinary diode (2) Zener diode 3) Both the diode 4) None of the above
- c) The barrier potential for Si type ordinary diode is \_\_\_\_\_ volt.
  - 1) 0.3 2) 0.7 3) 1.0 4) 10
- d) As compare to the ordinary diode the Zener diode is designed to work in \_\_\_\_region . Forward bias and linear 2 ) Reverse Bias and Break down 3) Both
  - 4) None of the above
- e) The \_\_\_\_\_ is used as N type impurity to be added with pure silicon material.
  - 1) Aluminium 2) Boron 3) Antimony 4) Any of the above
- f) State the application of schottky diode.
- g) State the name of various configurations of transistors.
- **h**) The transistor can be used as an amplifier.

The above statement is True/False. (Select correct option)

- i) The transistor have \_\_\_\_\_ potential barrier. 1) One 2) Two 3) Three 4) Four
- j) The efficiency of \_\_\_\_\_ rectifier is better. 1) Half wave 2) Bridge type Full wave
  - 3) Centre tapped full wave (4) Any of the above
- k) State the function of Drain terminal in the MOSFET.
- 1) List any two applications of laser
- m) Today's mobile technology use fiber optic cable infrastructure.



n) Give any two advantages of fiber optic communication.

## Attempt any four questions from Q-2 to Q-8 $\,$

Q-2		Attempt all questions	(14)
	<b>(a)</b>	Write short note on Zener Diode.	07
	<b>(b)</b>	Write short note on PN junction diode.	07
Q-3		Attempt all questions	(14)
	(a)	For a semiconductor, explain what is drift current and diffusion current?	07
	<b>(b)</b>	Briefly Explain about N- type semiconductors.	07
Q-4		Attempt all questions	(14)
	<b>(a)</b>	Write short notes on Bridge rectifier.	07
	<b>(b)</b>	Explain difference between BJT and FET.	07
Q-5		Attempt all questions	(14)
	<b>(a)</b>	Explain the series positive and negative clipper circuits with waveforms.	07
	<b>(b)</b>	Explain the phenomena of potential barrier in ordinary diode.	07
Q-6		Attempt all questions	(14)
	(a)	Draw the common base and common emitter configuration of transistor. State	07
		how transistor act in both the mode.	
	<b>(b)</b>	Find the concentrations of holes and electrons in p type silicon at $300^{0}$ Kelvin .	07
		Assume resistivity as 0.02 ohm-cm. Assume $\mu_p$ -= 475 $m^2/volt\text{-sec.}$ , ni= 1.458	
		$\times 10^{-10} \text{ per m}^3$ .	
Q-7		Attempt all questions	(14)
	(a)	With the help of energy band diagram explain energy band theory.	07
	<b>(b)</b>	Explain the law of mass action for atomic particles.	07
Q-8		Attempt all questions	(14)
	(a)	Explain the concept of forward bias and reverse bias of diode with suitable	07
		sketch.	
	<b>(b)</b>	Explain various types of optical fiber configuration.	07