

Total No. of Questions : 5]

SEAT No. :

**P1385**

[Total No. of Pages : 2

**[5623]-1005**

**F.Y. B.Sc. (Computer Science)**

**ELECTRONIC SCIENCE**

**ELC - 111 : Semiconductor Devices and Basic Electronic Systems**

**(Semester - I) (New Pattern) (CBCS - 2019) (Paper - I)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates:*

- 1) *Q.1 is compulsory.*
- 2) *Solve any three questions from Q.2 to Q.5.*
- 3) *Question 2 to 5 carry equal marks.*
- 4) *Draw neat labelled diagram wherever necessary.*

**Q1)** Solve any five of the following :

**[5 × 1 = 5]**

- a) Define the term PIV for a diode.
- b) Draw symbols for :
  - i) n-p-n transistor.
  - ii) p-n-p transistor.
- c) Name two substances that produce piezoelectric effect.
- d) State two types of MOSFET.
- e) Define Accuracy with reference to DAC.
- f) What is ripple?

**Q2) a)** i) With the help of circuit diagram explain working of full wave rectifier using diode. **[3]**

ii) For 4 bit R-2R ladder find the following **[3]**

- 1) Full scale output voltage.
- 2) Analog output voltage for digital input :
  - I) 1010
  - II) 1101.

b) Distinguish between CC, CB & CE configurations of transistor. **[4]**

**P.T.O.**

**Q3) a) i)** Draw the block diagram of online UPS and explain it's operation in "Mains ON" mode. [3]

ii) Explain working Enhancement mode MOSFET. [3]

b) Explain construction and working of photo diode. [4]

**Q4) a) i)** Draw diagram of Halfwave Rectifier with Filter capacitor. Explain role of capacitor in this circuit. [3]

ii) Explain working of MOSFET as a switch. [3]

b) Draw diagram of Wien bridge oscillator.  $R_1 = 1\text{ k}\Omega$   $C = 0.22\mu\text{F}$ . Calculate the frequency of Wien bridge oscillator. [4]

**Q5)** Attempt any four of the following : [4 × 2.5 = 10]

a) Draw block diagram of successive approximation ADC.

b) Explain how BJT works as a switch.

c) Write a short note on Zener effect.

d) An Astable 555 timer has  $R_A = 8\text{ k}\Omega$ ,  $R_B = 4\text{ k}\Omega$  and  $C = 0.1\mu\text{F}$ . What is the output frequency.

e) Define  $\alpha$  and derive an expression for  $\alpha$  in terms of  $\beta$ .

f) Write a short note on Opto coupler.

