

Total No. of Questions : 10]

SEAT No. :

PC-5205

[Total No. of Pages : 3

[6351]-114

First Year of Engineering

BASIC ELECTRONICS ENGINEERING

(2024 Pattern) (Semester - I) (ESC-101-ETC)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.
- 5) Use of electronic pocket calculator is allowed.

- Q1)** a) Explain the Impact of Electronics on industry and society? [5]
- b) Draw circuit diagram and explain operation of Bridge Rectifier with the help of neat waveforms? [5]
- c) Compare Active and Passive Components. [4]

OR

- Q2)** a) Draw circuit diagram and explain operation of Half-Wave Rectifier with the help of neat waveforms? [5]
- b) Draw and explain V-I characteristics of P-N Junction Diode. [5]
- c) Compare LED and Photodiode. [4]

- Q3)** a) What is N-Well method of VLSI CMOS manufacturing. [5]
- b) Draw the construction diagram and explain the operation of Enhancement type N-channel MOSFET in detail? [5]
- c) Determine the dc current gain β (Beta) and the emitter current I_E for a transistor where $I_B = 100 \mu A$ and $I_C = 5.65 \text{ mA}$. [4]

OR

P.T.O.

- Q4)** a) Draw and explain MOSFET as Switch. [5]
 b) Draw and explain the Output Characteristics of BJT in common emitter configuration and explain in detail? [5]
 c) Determine the dc current gain β (Beta) and the emitter current I_E for a transistor where $I_B = 50 \mu A$ and $I_C = 3.65 \text{ mA}$. [4]
- Q5)** a) Classify the different types of Logic Gates? Draw and explain any two Logic gates with its truth table & logic equation. [5]
 b) Draw the block diagram of Microprocessor and explain the functions of each block in detail. [5]
 c) Convert : [4]
 i) $(1100111)_2$ into $(--)__{10}$
 ii) $(75.371)_{10}$ into $(--)_2$

OR

- Q6)** a) State and Prove De-Morgan's Theorem. [5]
 b) Draw & Explain Full Adder Circuit with truth table. And logical expression. [5]
 c) Compare Microprocessor and Microcontroller in detail. [4]
- Q7)** a) Draw the block diagram of Digital Multimeter, Explain the function of each block. [5]
 b) Draw the Functional block diagram of operational amplifier and explain in detail. [5]
 c) Write any two Ideal and Practical characteristic of Op-Amp IC 741 [4]

OR

- Q8)** a) Draw the block diagram of Function Generator. Explain the function of each block. [5]
 b) For inverting amplifier using op-amp. If $R_1 = 1k\Omega$ and $R_f = 10k\Omega$ with $V_{CC} = \pm 12V$ applied calculate output voltage if, i) $V_{in} = 20mV$
 ii) $V_{in} = 2.2V$ Justify answer [5]
 c) Draw and explain the block diagram of Regulated DC power supply. [4]

- Q9)** a) What is the Selection criteria used while selecting the sensors for particular application? [5]
- b) Draw and explain Electromagnetic Frequency Spectrum with their applications. [5]
- c) Comparison of Active Sensors and Passive Sensors. [4]

OR

- Q10)** a) Describe the Block diagram of IoT based Data Acquisition. [5]
- b) Describe the Block diagram of GSM. [5]
- c) Describe the Basic block diagram of Communication System. [4]

