Total No. of Questions : 10]

SEAT No. :

PC-5205

[Total No. of Pages : 3

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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 IE for a transistor where I_B = 100 μA and I_C = 5.65 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 IE for a transistor where I_B = 50 μA and I_C = 3.65 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 R1 = 1kΩ and Rf = 10kΩ with V_{CC} = ±12V applied calculate output voltage if, i) Vin = 20mV ii) Vin = 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]**