[6581]-2406

F.E.

ESC-101-ETC : Basic Electronics Engineering

(2024 Pattern) (Semester - I/II)

Time : 2½ Hours] *[Max. Marks : 60*

Instructions to the candidates :

1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8 and 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) Recognize the Impact of Electronics on industry and society? [6]

b) Draw circuit diagram and explain operation of Bridge Rectifier with the help of neat waveforms? [6]

OR

Q2) a) Draw circuit diagram and explain operation of Half-Wave Rectifier with the help of neat waveforms? [6]

b) Draw V-I characteristics of P-N Junction Diode and define these parameters. [6]

i) Barrier Potential

ii) Reverse Breakdown Voltage

iii) Reverse saturation current

Q3) a) Draw the construction diagram and explain the operation of Enhancement type N-channel MOSFET in detail? [6]

b) Define Current Gain, α, β and γ. Determine the dc current gain β (Beta) and the collector current IC for a transistor where $I_B = 20\mu A$ and IE= 2 mA. [6]

OR

Q4) a) Draw the construction diagram and explain the operation of Enhancement type P-channel MOSFET in detail? [6]

b) Draw the V-I Characteristics of BJT in common emitter configuration and explain in detail? [6]

P.T.O.

Q5) a) Classify the different types of Logic Gates? Draw and explain any two Logic gates with its truth table & logic equation. [6]

b) Convert: $(1101.101)_2$ into $(--)_{10}$ and $(35.56)_{10}$ into $(--)_2$ [6]

State the binary addition rule and Perform the addition of $(110101)_2$ & $(0101)_2$

OR

Q6) a) Draw & Explain Half adder and Full adder Circuit using basic logic gates with truth table. [6]

b) Draw the block diagram of Microprocessor and explain the functions of each block in detail. [6]

Q7) a) Draw the block diagram of Digital Multimeter. Explain the function of each block. [6]

b) Summarize an Ideal characteristic of Op-Amp and mention the practical values of each one. [6]

OR

Q8) a) Draw the block diagram of Function Generator. Explain the function of each block. [6]

b) Explain Non inverting amplifier using op-amp in detail. And If R1 = 1kΩ and Rf = 10kΩ with Vcc = ±12V applied, Vin = 200mV. Calculate Voltage gain and Output Voltage. [6]

9) a) What are the different Selection criteria used while selecting the sensors for particular application? [6]

b) Provide a table of Electromagnetic Frequency Spectrum with their applications. [6]

OR

0) a) Describe the Block diagram of IoT based Data Acquisition and Automation System. [6]

b) Describe the Basic block diagram of Communication System. [6]

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