

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]



Total No. of Questions : 10]

SEAT No. :

PD-4037

[Total No. of Pages : 2

[6401]-2404

F.Y (Engineering)

ESC-101-ETC : BASIC ELECTRONICS ENGINEERING

(2024 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Neat diagrams must be drawn wherever necessary.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data, if necessary.
- 4) Use of electronic pocket calculator is allowed.

Q1) a) Draw and Explain V-I Characteristics of PN junction Diode. [5]

b) Explain Impact of Electronics on Industry and Society. [5]

c) Write a short note on Active and Passive Components. [4]

OR

Q2) a) Draw & Explain Circuit diagram of Half Wave Rectifier with waveforms. [5]

b) Explain construction & operation of Light Emitting Diode (LED). [5]

c) Draw and explain Diode as a Switch. [4]

Q3) a) Draw and explain operation of Enhancement Type N channel MOSFET. [5]

b) Draw and Explain Output Characteristics of common emitter mode. [5]

c) Explain N-well method of VLSI CMOS manufacturing. [4]

OR

Q4) a) Explain with a circuit diagram a Single Stage Common Emitter Amplifier. [5]

b) Compare BJT and MOSFET. [5]

c) Determine the dc current gain β (Beta) and Calculate value of I_C for BJT, if $I_B = 20 \mu A$ and $I_E = 2mA$. [4]

P.T.O.

- Q5)** a) Draw and Explain D flip flop with the help of Truth Table. [5]
 b) State and prove De-Morgan's Theorem. [5]
 c) Solve [4]
 i) Convert $(1101.101)_2$ into Decimal
 ii) Convert $(35.567)_{10}$ into Binary

OR

- Q6)** a) Explain the full Adder with the help of Block Diagram, Truth Table & Logic Expression. [5]
 b) Draw and explain block diagram of Microprocessor. [5]
 c) Draw and Explain JK flip flop with the help of Truth Table. [4]

- Q7)** a) Draw and explain the functional block diagram of an Operational amplifier (OP-AMP)? [5]
 b) Draw and Explain Block Diagram of Digital Storage Oscilloscope (DSO). [5]
 c) Define with typical & ideal values for IC 741, the following Operational amplifier (OP-AMP) parameters? [4]
 i) CMRR
 ii) Bandwidth

OR

- Q8)** a) Draw & Explain Block Diagram of Digital Multimeter (DMM). [5]
 b) For the Non - Inverting amplifier using op-amp if $R_F = 10\text{ K}\Omega$, $R_1 = 1\text{ K}\Omega$, $V_{cc} = \pm 12\text{V}$, $V_i = 100\text{mv}$. Calculate Voltage gain & Output voltage. [5]
 c) Explain Op amp application as an Inverting amplifier with the help of waveform. [4]

- Q9)** a) Draw & Explain block diagram of IoT based Data Acquisition System. [5]
 b) With the help of block diagram, explain operation of Electronic Communication System. [5]
 c) Compare Thermocouple and RTD. [4]

OR

- Q10)** a) Explain wired and wireless communication media. [5]
 b) Explain the principle of operation, construction and working of LVDT. [5]
 c) Draw and Explain detail architecture of GSM system. [4]

