

22371

12425

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following :

10

- (a) Draw the symbol of p-n junction diode & LED.
- (b) Define rectifier. State its types.
- (c) State the relationship between α & β of transistor.
- (d) State the different operating regions of BJT.
- (e) Convert following number into binary :
 $(364)_8 = (\quad)_2$
- (f) List the types of ADC.
- (g) Write the base of following number systems :
Binary, Decimal, Octal and Hexadecimal.

2. Attempt any THREE of the following :

12

- (a) Compare p-n junction diode and zener diode on the basis of :
 - (i) Symbol
 - (ii) Direction of conduction
 - (iii) Reverse Breakdown
 - (iv) Applications



- (b) Draw basic block diagram of DC regulated power supply and state the function of each block.
- (c) Draw logic diagram of full adder and write its truth table.
- (d) (i) Write the BCD equivalent of decimal $(428)_{10}$.
(ii) State rules of BCD addition.

3. Attempt any THREE of the following :

12

- (a) Explain the working of transistor as a switch.
- (b) With the help of neat block diagram explain the binary weighted register DAC. Write its mathematical expression.
- (c) Draw circuit diagram of centre tapped full wave rectifier and explain its operation with input and output waveform.
- (d) Draw the circuit diagram of J-K flip-flop using NAND gate and describe its working with truth table.
- (e) Add the binary numbers :
 - (i) $1011.11 + 1100.01$
 - (ii) $0101.1 + 1111.01$

4. Attempt any THREE of the following :

12

- (a) Draw the circuit diagram of single stage RC coupled amplifier and explain the function of each component.
- (b) Compare R-2R ladder DAC and weighted resistor DAC.
- (c) Explain the construction of NPN transistor with the help of diagram.
- (d) Draw the symbol of following logic gates and write its truth table :
 - (i) EX-OR gate (ii) EX-NOR gate
- (e) State the specification of DAC and explain any two.

5. Attempt any TWO of the following :**12**

- (a) Explain the working of 3-bit ripple counter (Asynchronous) using T-flip flop with suitable diagram and timing diagram.
- (b) Draw the construction of LED and explain its working principle. State two applications of it.
- (c) Compare half wave, centre-tapped and bridge type FWR on the basis of :
 - (i) Number of diodes used (ii) Ripple factor
 - (iii) Rectification efficiency (iv) Peak inverse voltage
 - (v) Ripple frequency (vi) Applications

6. Attempt any TWO of the following :**12**

- (a) Why NAND and NOR gates are called universal gates ? Prove that NAND and NOR gates are universal gates.
 - (b) Explain 4:1 multiplexer. State applications of multiplexer.
 - (c) Draw π -filter using full wave rectifier & explain its operation with input and output voltage waveform.
-

