

22371

22232

3 Hours / 70 Marks

Seat No.

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- 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.
  - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :**

**10**

- (a) Draw symbol of zener diode and photo diode.
- (b) Draw symbol of NPN and PNP BJT.
- (c) State needs of Rectifier.
- (d) List application of Transistor.
- (e) Perform  $(5)_{10} - (10)_{10}$  using 1's complement method.
- (f) Write OR laws in Boolean Algebra.
- (g) Write specification of IC 0808.



- 2. Attempt any THREE of the following :** **12**
- (a) Draw and explain V-I characteristics of P-N junction diode.
  - (b) Compare half wave and full wave rectifier on following parameters :
    - (i) Maximum efficiency
    - (ii) Ripple factor
    - (iii) Output frequency
    - (iv) Number of diodes used
  - (c) State the application of shift register.
  - (d) State and Prove De Morgan's theorems.
- 3. Attempt any THREE of the following :** **12**
- (a) Explain working of single slope ADC with suitable diagram.
  - (b) Explain working of zener diode as a voltage regulator with circuit diagram.
  - (c) Define  $\alpha$  and  $\beta$  of transistor and derive the relation between  $\alpha$  and  $\beta$ .
  - (d) Convert following :  
 $(AC)_{16} = (?)_{10} = (?)_8 = (?)_2$
  - (e) Draw logic diagram of full Adder and write its truth table.
- 4. Attempt any THREE of the following :** **12**
- (a) Implement the following function using :  
16:1 multiplexer  $Y = \sum m(1, 2, 5, 6, 8, 12)$
  - (b) Describe working of half wave rectifier with the help of circuit diagram and waveforms.
  - (c) Draw circuit diagram of single stage RC coupled CE amplifier and state the function of each component.
  - (d) Write rules of BCD addition and perform the following operation in BCD  
 $(28)_{10} + (16)_{10}$ .
  - (e) Draw Pin diagram of IC 0808 and IC 0809.

- 5. Attempt any TWO of the following : 12**
- (a) Describe the working of 4 bit universal shift register.
  - (b) Show constructional details of LED. Give application of LED.
  - (c) Draw input and output characteristics of CE configuration and show various regions.
- 6. Attempt any TWO of the following : 12**
- (a) Draw block diagram of DC regulated power supply and explain function of each block with waveforms.
  - (b) Draw (i) OR (ii) AND (iii) NOR gate using NAND gate only.
  - (c) Draw the circuit diagram of 4 bit R-2R ladder DAC and obtain its output voltage expression.
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