

22371

23124

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.

Marks

1. Attempt any FIVE of the following :

10

- (a) Draw V-I characteristics of Zener diode.
- (b) Draw symbols of NPN & PNP transistors.
- (c) State types of rectifiers.
- (d) Define unipolar and bipolar devices.
- (e) List different types of number system.
- (f) Convert following into 2's complement $(1001)_2$.
- (g) Draw pin diagram of IC 0808.

2. Attempt any THREE of the following :

12

- (a) Explain V-I characteristics of Zener diode with the help of circuit diagram.
- (b) Compare L and C filter on the basis of following parameters :
 - (i) Position of component in the circuit
 - (ii) Ripple formula
 - (iii) Circuit diagram
 - (iv) Advantage
- (c) Draw and explain full adder.
- (d) Draw symbol and truth table of NOR and NAND gate.



- 3. Attempt any THREE of the following : 12**
- (a) Draw and explain R-2R ladder type data converter.
 - (b) Draw a circuit diagram of +5V complete DC power supply formed by using IC 7805 and explain it.
 - (c) Draw a circuit of single stage RC coupled amplifier. Explain its working.
 - (d) Convert the following :
 - (i) $(111101)_2 = (?)_{16}$
 - (ii) $(25)_{16} = (?)_2$
 - (e) Draw and explain 8 : 1 multiplexer with truth table.
- 4. Attempt any THREE of the following : 12**
- (a) List different types of shift registers. Explain in detail Serial In Parallel Out (SIPO) register.
 - (b) Describe the working of centre tapped full wave rectifier with input and output waveforms.
 - (c) Derive the relationship between α and β .
 - (d) 'NAND gate is called as Universal gate'. Justify this statement with any two examples.
 - (e) Draw the block diagram of dual slope ADC.
- 5. Attempt any TWO of the following : 12**
- (a) Explain T and D flip flop with diagram and truth table.
 - (b) Compare PN junction diode and Zener diode. (Any 6 points)
 - (c) Compare CB, CE and CC configurations of transistors. (Any 6 points)
- 6. Attempt any TWO of the following : 12**
- (a) Draw a complete block diagram of DC power supply and explain each block of power supply.
 - (b) Prove De Morgan's first and second theorem with statements.
 - (c) Describe Successive Approximation ADC.
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