22371

23124

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.
(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.
