

313303

25226

3 Hours / 70 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answer with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) 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) Convert $(79)_{10}$ into octal number.
 - b) State duality theorem and give an example.
 - c) List applications of BCD codes. (Any two points)
 - d) Draw symbol of EX-NOR gate and write its truth table.
 - e) List applications of Multiplexer and Demultiplexer. (Any two each)
 - f) What is sequential logic circuit? Give example. (Any one)
 - g) Differentiate between volatile and non-volatile memory (Any two points)

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- 2. Attempt any THREE of the following: 12**
- a) Minimize following expression using K-map.
 $F(A, B, C, D) = \sum m(0, 1, 4, 5, 7, 8, 13, 15).$
 - b) Design Basic Gates using NAND gate.
 - c) Perform the following subtraction using 2's complement method.
1) $(52)_{10} - (63)_{10}$
 - d) Describe working of J.K. Flip-Flop with truth table and logic diagram.
- 3. Attempt any THREE of the following: 12**
- a) Convert the following binary number $(11001101)_2$ into decimal number, hexadecimal number, Gray Code and Excess-3 Code.
 - b) Compare TTL and CMOS logic families on the basis of following:
 - i) Propagation delay
 - ii) Power dissipation
 - iii) Speed of operation
 - iv) Basic gates.
 - c) Design full adder using K-map.
 - d) Describe working of R-2R Ladder DAC with neat diagram.
- 4. Attempt any THREE of the following: 12**
- a) Draw and explain 4:2 priority encoder with block diagram, truth table and logic diagram.
 - b) Describe operation of 3-bit twisted Ring counter, with logic diagram, Truth table and waveforms.
 - c) Describe operation of 4-bit universal shift register with its block diagram.
 - d) Describe working of dual slope ADC with its block diagram.
 - e) Compare EPROM and flash memory. (Any four points)

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

- a) Solve the following:
 - i) State commutative and associative laws for binary numbers.
 - ii) Reduce following Boolean expression using Boolean laws.
$$Y = A.B + \bar{A}.B + A\bar{B} + \bar{A}.\bar{B}.$$
- b) Describe working of master slave JK Flip Flop with truth table and logic diagram.
- c) Explain BCD to 7-segment decoder using truth table, circuit diagram and realize code for b and g using K-map.

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

- a) Design 8:1 Mux using 2:1 MUX. List applications of multiplexer and demultiplexers. (Two each)
 - b) Define modulus of counter. Describe 3-bit ripple counter design using J-K FF with timing diagram.
 - c) How does Solid State Drive Stores data electronically? What are main parts of it? Describe them in detail.
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