

22320

23242

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 answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
- (7) Preferably, write the answers in sequential order.

Marks

1. Attempt any FIVE of the following:

10

- a) List the uses of following codes:
 - i) BCD code
 - ii) ASCII
- b) Write the one application of SR-FF and mention its one drawback.
- c) State the advantages of using tri state logic in combinational logic.
- d) Draw excitation table of T FF.
- e) List any two specifications of IC 0809.
- f) Define : Encoder
- g) Name four types of shift register.

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- 2. Attempt any THREE of the following:** **12**
- a) Perform the following subtractions using 2'S compliment method.
 - i) $(1100) - (0011)$
 - ii) $(10101) - (11100)$
 - b) Draw the MUX tree for 32:1 MUX using 4:1 MUX only.
 - c) Name the basic building block used in CPLD and state their functions.
 - d) Minimize the following expression using K-map :
 $f(A, B, C, D) = \Sigma m(2, 3, 6, 10, 11, 12, 14, 15)$
- 3. Attempt any THREE of the following:** **12**
- a) Compare TTL and CMOS logic on the basis of :
 - i) Noise margin
 - ii) Figure of merit
 - iii) Speed of operation
 - iv) Fan in
 - b) Realize the following logic operations using only NOR gates
 - i) OR
 - ii) EX-NOR
 - c) Design the IC7490 as mod-B counter and describe its operation.
 - d) Calculate the analog output of 8-Bit DAC for digital input 10011100. Assume $V_{fullscale} = 5V$.

- 4. Attempt any THREE of the following:** **12**
- a) Draw the symbol, truth table and logical expression of following gates :
 - i) EX-OR gate
 - ii) NAND gate
 - b) Draw the full adder circuit's logic diagram, truth table and K-map simplification.
 - c) Draw the binary to gray code converter with the help of truth table and its K-map simplification.
 - d) Describe the working of clocked SR flip-flop with preset and clear.
 - e) Describe the working principle of dual slope type of ADC with neat diagram.
- 5. Attempt any TWO of the following:** **12**
- a) Design 4-bit ripple counter and draw output waveforms.
 - b) Compare weighted resistor DAC with R-2R ladder type DAC (any six points).
 - c) Convert the following
 - i) $(ABCD)_{16} = (?)_{10}$
 - ii) $(101011001111)_2 = (?)_{10}$
 - iii) $(101011001111)_2 = (?)_8$
- 6. Attempt any TWO of the following:** **12**
- a) Draw universal shift register and describe its operation.
 - b) Draw the 4-Bit adder, circuit using IC7483 and describe its working with suitable examples.
 - c) Draw the circuit diagram of 3-input TTL NAND gate and explain its working.
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