Total No. of printed pages = 5

EI/Co/It-403/DE/4th Sem/2018/M

DIGITAL ELECTRONICS

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer both Part A and B.

PART – A

Marks – 25

1. Fill in the blanks : $1 \times 10 = 10$

   (i) In octal system there are _____ digits.

   (ii) ASCII is an _____ codes.

   (iii) A NAND gate acts as _____ AND gate.

   (iv) An inverter is also known as _____ gate.

   (v) In K-map adjacent pair eliminates _____ variables.

   (vi) $A + \bar{A} =$ ____.

[Turn over

(vii) Multiplexer is a _____ logic circuit.

(viii) A half adder can add _____ bits.

(ix) LED stands for _____.

(x) Pocket calculators use _____ system.

2. State whether the following are true or false : $1 \times 10 = 10$

(i) In binary number system, the base is 2.

(ii) $10 - 1 = 0$

(iii) A 4 variable Karnaugh map for sop form has 16 cells.

(iv) A sequential logic circuit has a memory.

(v) A combinational logic circuit has an output of 1 or 0.

(vi) $A . A = 1$

(vii) In hexadecimal system the base is 16.

(viii) NAND and NOR gates are univeral gates.

(ix) Gallium arsenide is used in LEDs.

(x) Zero suppression is not used in practice.

3. Choose the correct words from those given within blanks. 1×5=5

(a) A NAND gate acts as _____ AND gate.

(i) NOT (ii) OR (iii) XOR gate

(b) If both inputs of XOR gate are high, the output will be _____.

(i) Medium (ii) Low (iii) High

(c) A min terms Boolean expression is known as _____ form

(i) Sum of product

(ii) Product of sum

(d) A half adder can add _____ bits.

(i) One (ii) Two (iii) Three

(e) Power consumption of LCD is _____.

(i) Small (ii) Very small

PART – B

Marks – 45

1. Convert the following : 2×3=6

(i) 100101_2 = _____$_{10}$

(ii) 3289_{10} = _____$_2$

(iii) 438_8 = _____$_{16}$

2. Answer the following questions :

(a) Answer any *two* : 2×3=6

(i) What is meant by 1's complement and 2's complement ?

(ii) What is floating point representation ?

(iii) Draw a NOT gate. Write its truth table.

(b) Write short notes on any *two* : 2×3=6

(i) Multiplexer

(ii) Half adder

(iii) LED and LCD.

Answer any *three* questions.

3. (a) Using K-map minimize the function : 6
$f(A,B,C,D) = \Sigma m\,(0,1,2,3,5,7,8,9,11,14)$

(b) Draw the logic diagram for the above minimize expression. 3

4. (a) Define with symbol and truth table. 6
NOR, NAND, XOR

(b) Draw logic circuit for the expression 3
$Y = ABC + AB\bar{C} + \bar{A}B\bar{C}$

5. (a) Differentiate between the functions of multiplexer and de-multiplexer. 6

(b) Draw logic circuit of a 4:1 multiplexer and explain its working. 3

6. (a) State and prove De Morgan's theorems. 5

(b) What is duality theorem ? Find dual of

(i) $A + 0 = A$ (ii) $A \cdot \overline{A} = 0$ 4