F.Y. B. SC. (Computer Science) SEM – I (CBCS 2018 COURSE) : WINTER - 2018
SUBJECT: PRINCIPLES OF DIGITAL ELECTRONICS-I

W-2018-0890

Day : Saturday   Time: 11.00 AM TO 02.00 PM

Date : 20/10/2018   Max. Marks: 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of log table and scientific calculator is allowed.

Q.1   Answer **ANY TWO** of the following   **(12)**

a) What is a multiplexer? Explain 4:1 multiplexer using AND-OR gates Also give its truth table.

b) With neat diagram explain the working of 4 bit universal Adder subtractor.

c) The code 100101010 is received with odd parity. Correct error if any. There are four parity bits.

Q.2   Answer **ANY TWO** of the following   **(12)**

a) Simplify the function and realize $F = \pi(1,3,5,8,9,11,13,15)$

b) Explain the action of 3:8 decoder using AND-NOT gates.

c) i) State De-Morgans theorems.
ii) Explain NAND and EX-OR gates with symbol, truth table and equation of output.

Q.3   Answer **ANY TWO** of the following   **(12)**

a) Implement $Y = (\overline{A} + B)(A + C)$ by using only NAND and NOR gates.

b) With necessary diagram explain the working of 1:4 demultiplexer.

c) Name the different logic families. Define the following parameters for logic families: i) Operating speed   ii) Power dissipation
              iii) Fan-Out   iv) Input and Output logic levels.

Q.4   Answer **ANY THREE** of the following   **(12)**

a) Construct NOT and AND gate using NOR gate.

b) i) Convert $(13.85)_{10} = (?)_2$
ii) Convert $(101101.1010)_2 = (?)_{10}$

c) What is an encoder? Explain decimal to BCD encoder.

d) What is Karnaugh map? Give the structure of two, three and four variable K-map.

Q.5   Answer **ANY FOUR** of the following   **(12)**

a) i) What is the difference between positive and negative logic.
ii) Draw the symbol and write the truth table of two input bubbled OR gate.

b) Find 2's complement of the given number i) 10101 ii) 00101

c) Draw logic diagram for full adder. Also write its truth table.

d) Draw the logic circuit whose Boolean equation is $Y = \overline{A + B} + \overline{C}$

e) Perform the following conversions: i) $(162.23)_{10} = (?)_8$ ii) $(242)_8 = (?)_{10}$

f) Simplify :i) $\overline{(A + B) + \overline{C}}$ ii) $\overline{\overline{AB} + \overline{A} + AB}$ iii)
$\overline{(\overline{AB}\overline{C})} + (A\overline{B}C)$

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