

**F.Y. B. SC. (Computer Science) SEM – I (2014 COURSE) : WINTER
2018**

SUBJECT: DIGITAL ELECTRONICS – I

Day: - Tuesday
Date: 23/10/2018

W-2018-0943

Time: 12.00 NOON TO 02.00 PM
Max Marks. 40

N.B.

- 1) All questions are **COMPULSORY**.
 - 2) Answers to the right indicate **FULL** marks
 - 3) Draw diagrams **WHEREVER** necessary.
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Q.1 Answers any **TWO** of the following **(10)**

- a) Draw and explain the working of a 4 – bit parallel adder.
- b) Define multiplexer. Explain the working of 4: 1 multiplexer using AND – OR gates with neat diagram.
- c) Simplify the following Boolean expression using Boolean laws:
 $Y = (A+B) (A + C)$

Q.2 Answers any **TWO** of the following **(10)**

- a) Draw the logic diagram of BCD to decimal decoder. Explain its working.
- b) Simplify the following expression using K – map
 $Y = \overline{A} \overline{B} \overline{C} + \overline{A} \overline{B} C + \overline{A} B \overline{C} + \overline{A} B C$
- c) Explain the working of full adder with necessary diagram.

Q.3 Answers any **TWO** of the following **(10)**

- a) Construct OR and AND gates using NAND gates only.
- b) Explain the working of decimal to binary encoder.
- c) i) State any two Boolean identities
ii) What is tri-state logic?

Q.4 Answers any **FIVE** of the following **(10)**

- a) Write the truth label for half adder.
- b) Draw the symbol and truth table for 2 input OR gate and 2 input NAND gate.
- c) Specify the number of variables eliminated for
 - i) A pair
 - ii) A quad in a K - map
- d) State De – Morgan's first and second theorem.
- e) Perform the following conversion:
 $(183)_{10} = (?)_{BCD}$
- f) Define the following parameters related to logic families
 - i) Propagation delay
 - ii) Power dissipation
- g) Perform the following subtractions using 2's complement : $(138)_{10} - (72)_{10}$

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