

F.Y. B. SC. (COMPUTER SCIENCE) SEM – I (2014 COURSE) :
SUMMER - 2018
SUBJECT : DIGITAL ELECTRONICS – I

Day : **Wednesday**
Date : **25/04/2018**

S-2018-0833

Time : **12.00 NOON TO 02.00 PM**
Max. Marks : 40

N.B.:

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw diagrams **WHEREVER** necessary.
-

Q.1 Attempt **ANY TWO** of the following: **[10]**

- a) With neat diagram explain the working of 4:1 multiplexer.
- b) Implement $Y = (\overline{A} + B) \cdot (A + C)$ by using only NAND and NOR gates.
- c) Explain the working of full-adder with neat diagram and truth table..

Q.2 Attempt **ANY TWO** of the following: **[10]**

- a) Draw diagram for 1:4 demultiplexer and explain it. Also draw its logic symbol and write truth table for it.
- b) Construct the Hamming code for the message bits 1011 using the odd parity system.
- c) State and explain De-Morgan's theorems.

Q.3 Attempt **ANY TWO** of the following: **[10]**

- a) What is a decoder? Explain 1 : 4 decoder with logic diagram and truth table.
- b) Explain any five logic gates with respect to logic symbol and truth table.
- c) Plot and simplify the following Boolean function using K-map:

$$F = \Sigma (0, 3, 4, 5, 6, 8, 10, 12)$$

Q.4 Attempt **ANY FIVE** of the following: **[10]**

- a) Convert the following: **i)** $(4A8C)_{16} = (?)_2$ **ii)** $(38)_{10} = (?)_2$
- b) Reduce the following Boolean expression using Boolean identities :
 $AB + A(B + C) + B(B + C)$.
- c) Define the following parameters of logic families:
i) Fan-out **ii)** Power dissipation
- d) State one application of each: **i)** Multiplexer **ii)** Encoder
- e) Convert the following: **i)** $(48)_{10} = (?)_8$ **ii)** $(3B2)_{16} = (?)_{10}$
- f) State any two laws of Boolean algebra.
- g) Define quad and octet for K-map.