Roll No. | | | | | | | | | | |

Paper Code: MCA115

MCA

(SEM I) CARRY OVER EXAMINATION 2016-17

DIGITAL LOGIC DESIGN

[TIME: 3 hrs] **[Max. Marks: 70]**

Note: Attempt all questions. All questions carry equal marks.

Q.1. Attempt any TWO of the following:

a) What do you understand by the digital logic? How digital logic design is helpful in understanding computer system.
b) Perform the following operation.
$(738)_8$-$(123)_{16}$+$(100)_{10}$
c) Perform the following subtraction using (i) 1'5 complement and (ii) 2'5 complement
$(11010)_2$-$(10000)_2$
$(1000100)_2$-$(1010100)_2$

Q.2. Attempt any **TWO** of the following:

a) What is the role of error correcting codes? Explain any two types of error correcting codes with example.
b) What is gray code? Why it is called unit distance code? Find the gray codes for the following binary members
(i) 11001100 (ii). 01011110
c) Simply the following Boolean equations using Boolean algebra rules.
(i). $Y(A,B,C) = ABC + A\bar{B} + ABC\bar{}$
(ii). $Y(A,B,C,D) = ACD + \bar{A}BCD$

Q.3. Attempt any **TWO** of the following:

a) What do you understand by standard representation for logical function-
(i). Sum of Products (ii). Product of Sum
b) Minimize the following expressions using K-map
(i). Y(A,B,C)= $\sum$ m (0, 1, 2, 3, 4, 5, 6, 7)
(ii). Y(A,B,C)= $\sum$ m (0, 2, 4)
c) Design a combinational logic circuit with four input variables that will produce logic 1 output when the number of 1s in the inputs is even.

Q.4. Attempt any **TWO** of the following:

a) Draw and explain n-bit parallel adder.
b) What do you understand by Mod of counter? Draw Mod-5 up counter & explain its working.
c) What do you understand by multiplexor? Why it is called data selector. Draw a 16x1multiplexor and explain its working.

Q.5. Write short note on any two of the following:

a) Bidirectional shift register.
b) Algorithm state machines.
c) Programmable logic devices.