Printed Pages: 1

BCS11 **Roll No.** | | | | | | | | | | | |

B. Tech.
(SEM III) ODD SEMESTER
MAJOR EXAMINATION 2015 - 2016

DIGITAL CIRCUITS & LOGIC DESIGN

Time: 3 Hrs. **Max. Marks: 40**

Note: Answer all questions.

Q.1 Attempt any three of the following from Unit-I. Q.1 (a) is compulsory.

a Find the value of x in the following: (3)

(i) $(653)_7 \times (523)_7 = (x)_7$ (ii) $(D6C.5B)_{16} = (x)_4$

(iii) $x = (11010)_2 - (1101)_2$ subtract using 2's complement. (iv) $(21340)_5 = (x)_{10}$

b (3)

(i) Prove that (A+B'+AB)(A+B')(A'B) = 0.

(ii) Implement the Boolean function F = A'B'C + A'BC'+A'C' with NAND gate only.

c Explain the block parity concept to check and correct the error in a single bit with example. (3)

d Hamming code 101101101 is received at receiver end with even parity. Correct it if any errors. (4)

Q.2 Attempt any three of the following from Unit-II. Q.2 (a) is compulsory.

a Design a 4 bit carry look ahead generator. (4)

b Minimize the given Boolean function using K- map and implement the simplified function using NAND gates only. $F(A,B.C.D) = \sum m(0,1,2,3,7,8,10) + d(5,6,11,15)$ (3)

c Construct a 32x1 multiplexer with 4x1 multiplexers. Use block diagrams. (3)

d Design a BCD to decimal decoder using the unused combinations of the BCD code as don't care conditions. (3)

Q.3 Attempt any three of the following from Unit-III. Q.3 (a) is compulsory.

a Draw the schematic diagram of J-K flip – flop and describe its working. Write down its truth table (4)

b Draw the logic diagram of a 2 to 4 line decoder with only NAND gates. Include an enable input. (3)

c Design a synchronous counter which steers through the following states S4-S3-S6-S2-S5-S0 using J-K Flip Flops. (3)

d Explain the working of 4-bit ripple counter with circuit diagram and timing diagram. (3)

Q.4 Attempt any three of the following from Unit-IV. Q.4 (a) is compulsory.

a Draw and explain the working of universal shift register. (4)

b A certain memory has a capacity of 8K*32. How many bits are there in each word? How many words are being stored? How many address bits are required to uniquely identify each location? (3)

c Differentiate between static and dynamic RAM on the basis of four parameters. (3)

d What do you understand by fundamental mode of operation? Discuss different types of Hazards in Asynchronous sequential circuit by giving suitable example. (3)