

EX - 403**B.E. IV Semester Examination, December 2014****Digital Electronics Logic Design - I***Time : Three Hours**Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each questions are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
 iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Convert the following:

i) $(2DB)_{16} = (\quad)_{10}$

ii) $(498)_{10} = (\quad)_8$

b) convert the min term expression $\overline{A}.B.C + \overline{A}.\overline{B}.\overline{C} = y$ to its max term form.

c) Simplify the following Boolean expression using K-map.

$$\overline{A}B\overline{C}D + \overline{A}\overline{B}CD + \overline{A}BCD + \overline{A}BC\overline{D} + A\overline{B}CD + ABCD = Y$$

d) Simplify the following Boolean function by using tabulation method

$$F = \Sigma (0, 1, 2, 8, 10, 11, 14, 15)$$

OR

Draw the logic diagram for parity generation and checking and explain how parity generation and checking is done. Draw the truth tables in support of your answer.

2. a) Draw the truth table, logic diagram and expression of outputs for half adder.

b) Construct a full adder from half adders and an OR gate.

c) Design a 3-bit parallel adder using half adders and full adders.

d) Describe the rules for BCD addition and hence design a BCD adder.

OR

Draw the circuit of look ahead carry generator and explain its working.

3. a) What is the difference between combinational circuit and sequential circuit? Explain with examples.

b) Draw the logic symbol and truth table for clocked RS flip flop.

c) Define and explain state table and state diagram.

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- d) Draw the logic symbol and truth table for J-K flip flop. Explain its operation. What is toggling? Explain discuss how JK master slave flip flop is an advantage over J-K flip flop.

OR

How RS flip flop is converted to D flip flop? Explain the working of edge triggered D flip flop giving its logic symbol and truth table.

4. a) What is the difference between synchronous and asynchronous counters?
b) Define terms such as shift right, shift left, parallel load and serial load as referred to shift registers.
c) Design a 4-bit serial load shift register using D flip flops.
d) Design a 4-bit up-down counter using J-K flip flops.

OR

Design a 3 digit BCD counter. Give its truth table.

5. a) List at least three uses of read only memories.
b) Define PLDs and mentions its advantages.
c) Define and compare ROM, EPROM, EEPROM, flash E EPROM and CD-ROM.
d) With the help of circuit diagram explain the working of successive approximation type of A/D converter.

OR

Draw the circuit diagram of R/2R D/A converter and explain its operation.
