B.TECH(ECE),SEM III, 2014

Digital Circuit and Logic Design

PAPER CODE: BTEC 302

PAPER ID:[A1131]

Time: 03 Hours **Maximum Marks: 60**

Instruction to Candidates:

1. Section-A is compulsory, containing of Ten questions carrying Two marks each.
2. Section-B contains Five questions carrying Five marks each and student has to attempt any Four questions.
3. Section-C contains Three questions carrying Ten marks each and student has to attempt any Two questions.

Section – A

Q1.

i. Convert $(472.325)_8$ to decimal and binary.
ii. Generate a 3-bit Gray code.
iii. Determine logic required to decode binary number $(1011)_2$ by giving a high indication on output.
iv. When and where do we use Open-collector operation?
v. Determine conversion time of Successive-approximation ADC for a 12-bit resolution at 2.5MHz.
vi. Draw and explain the circuit diagram and truth table for a SR flip-flop.
vii. What is the most widely used method of representing binary numbers and performing arithmetic in computer systems?
viii. Simplify and implement the expression using Boolean algebra:
   i. $Y = A'B'C + BC' + A'BC + ABC$
ix. How the information is transferred into and out of a register?
x. Define a Gate and discuss its types. Convert NAND to NOR gate.

Section – B

Q2. Minimize and implement four-variable switching function using Q-M tabulation method:
$$F(A, B, C, D) = \sum (0, 1, 2, 3, 4, 6, 8, 9, 10, 11)$$

Q3. Differentiate between serial loading and parallel loading for a shift-register.

Q4. Describe how the problem of variable load is overcome by using Totem-pole arrangement?

Q5. Design a 3-bit binary-to-octal decoder.

Q6. Explain the operation of a Parallel-encoded Analog to Digital converter.

Section – C

Q7. Design a Down counter, that counts in the sequence of 6-5-4-3-2-6-5-4-3-2-6-5, and so on using JK flip-flop.

Q8. (i) How will you convert a D flip-flop into a JK flip-flop.
(ii) Describe search operation in CAM.

Q9. (i) Explain how a programmable ROM is formed.
(ii) What is the difference between PLA and PAL? Explain PAL in detail.
