Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electronics Engg.) (2012 Onwards)

B.Tech.(ECE/Electronics & Computer Engg./ETE) (2011 Onwards)

(Sem.–3)

DIGITAL CIRCUITS AND LOGIC DESIGN

Subject Code : BTEC-302

Paper ID : [A1131]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Q1. Write briefly :

i. Perform the following subtraction using 10's complement method: 196-155.

ii. Explain the difference between Gray code and the regular binary code.

iii. Give one example each of an even and an odd parity generator, using suitable diagrams.

iv. Distinguish between address and contents of a memory location.

v. Determine the minimum conversion interval of an ADC using an 8-stage counter with a clock frequency of 2MHz.

vi. Explain the working of a T flip-flop.

vii. Differentiate between a fixed-point number and a floating-point number.

viii. Describe a simple four-line multiplexer.

ix. Draw the circuit diagram of a diode AND gate and explain its working.

x. Convert $(F80B)_{16}$ to binary.

SECTION - B

Q2. Obtain the minimal POS and SOP forms for the function given as :

$F(A, B, C, D) = \pi(3, 4, 6, 7, 11, 12, 13, 14, 15)$

Q3. Briefly explain the working of a 4-bit Bidirectional Universal shift register.

Q4. What is the significance of TTL? Describe the basic circuitry of a three-input TTL NAND gate.

Q5. Design a 2's complement BCD Adder/Subtractor.

Q6. Describe the Counter-ramp method of ADC.

SECTION-C

Q7. Design a Mod-5 Up counter, that counts in the sequence of 6-7-8-9-10-6-7-8-9-10 and so on using JK flip-flop.

Q8. i) Explain the operation of a Master-Slave JK flip-flop.

ii) Discuss Dual-slope Analog-to-Digital conversion operation.

Q9. i) Briefly describe RAM family.

ii) Explain and give a comparison of the various logic families in tabular form by defining all the parameters.