C   C7120

Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: IT201

Course Name: DIGITAL SYSTEM DESIGN (IT)

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks.

Marks

1 a) i) $(8745)_{10} = (?)_2$ ii) $(110100101011)_2 = (?)_{10}$ (7)
       iii) $(9B450)_{16} = (?)_{10}$ iv) $(56363)_{10} = (?)_{16}$
       v) $(F8E0D)_{16} = (?)_2$ vi) $(10010010)_2 = (?)_8$ vii) $(12534)_8 = (?)_{10}$

   b) How negative numbers are represented digitally? Explain arithmetic over   (4)
       negative numbers in various representations. Explain merits and demerits of
       different negative number representations.

   c) Explain Gray code and Excess -3 Code.   (4)

2 a) Minimize the functions using K-map.   (8)
       f $(A,B,C,D) = \Sigma m (0,1,2,3,4,5) + d(10,11,12,13,14,15)$

   b) List out the postulates of Boolean algebra with examples.   (7)

3 a) Explain Quine – McClusky method for simplification for logic circuits with (8)
       examples.

   b) Explain floating point representations and their arithmetic with examples. (7)

PART B
Answer any two full questions, each carries 15 marks.

4 a) Design a 4-bit adder and compare it with carry look ahead adder.   (6)

   b) Design a binary to gray code converter.   (4)

   c) Design a circuit to generate odd parity bits for decimal numbers represented in (5)
       BCD code.

5 a) Distinguish between combinational and sequential circuits.   (4)

   b) Explain the working of master slave flip-flop.   (5)

   c) Design decimal to binary encoder.   (6)

6 a) Describe procedure for converting from one type of flip-flop to another and (6)
       perform i) JK to D   ii) D to T   iii) RS to JK

   b) Explain how a 3-bit counter can be implemented using a multiplexer.   (4)

   c) Explain state reduction with example.   (5)

PART C
Answer any two full questions, each carries 20 marks.

7 a) Design a serial in parallel out shift register.   (10)

   b) Explain different types of ROMs.   (4)

   c) What are applications for shift registers?   (6)

8 a) Design and implement ring and Johnson counters.   (10)

   b) Distinguish between PAL and PLA.   (4)

   c) Explain different types of error-detecting codes.   (6)

9 a) Design a decimal up –down counter with a mode control.   (8)

   b) Design and implement a universal shift register.   (8)

   c) Explain Booths algorithm with example.   (4)

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