DEPARTMENT OF ELECTRONICS & COMMUNICATION
"T1 Examination, AUG-2018"

Semester: 3rd
Subject: Principles of Digital Electronics & Ckt. Design
Branch: ECE/CSE
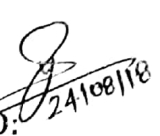**Course Type:** Core
Time: 90 Minutes
Program: B.Tech

Date of Exam: 04/09/18
Subject Code: ECH207-T
Session: II
Course Nature: Hard
Max.Marks: 30
Signature: HOD/Associate HOD: 24/08/18

Note: Part A: All questions are compulsory. Each Question carries 2 marks. Part B: Attempt any two questions. Each Question carries 10 marks.

PART-A

Q1.
a) Convert $(3FA7)_{16}$ in to equivalent decimal & octal numbers.
b) Write the next three numbers in the octal sequence: - 624, 625, 626, _____ .
c) Add -75 to +26 using the 8-bit 2's complement arithmetic.
d) Perform the following conversions.
   i. $(0.625)_{10} = (?)_2$
   ii. $(1100.1011)_2 = (?)_{10}$
e) Solve the given Boolean equation using Demorgan's theorem. $\overline{A\bar{B} + \overline{BC} + C\bar{D}}$

PART-B

Q2. a) Show that $A\bar{B}C + B + B\bar{D} + AB\bar{D} + \bar{A}C = B + C$ using Boolean algebra.   [5]
b) Minimize the following expression using k-map and implement the expression using basic gates. [5]
$$Y = \pi M (2, 8, 9, 10, 11, 12, 14)$$

Q3. a) The message below coded in 7-bit Hamming code is transmitted through a noisy channel. Decode the message assuming that at most a single error occurred in each code word.   [6]
   1.) 1110110
   2.) 1110101.

b) Perform the following operations.   [4]
  i.   1101 Gray code to Binary.
  ii.   Excess-3 code for 1101.
  iii.   Binary multiplication 101.11 * 111.01
  iv.   Divide $(1111000)_2$ by $(100)_2$

Q4. a) Perform the following operations.   [2+2]
  1. Subtract $(36)_{10}$ and $(24)_{10}$ by converting them in to binary.
  2. Find the signed magnitude representation for (-27).

b) Minimize the following expression using k-map   [6]
$$y = \sum m (0,1,5,9,13,14,15) + d (3,4,7,10,11)$$

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