

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

Mid-Semester Examination
Course No.: EEE 4335
Course Title: Digital Logic Design

Winter Semester, A.Y. 2015-2016
Time: 90 Minutes
Full Marks: 75

There are 4 (four) questions. Answer any 3 (three) questions. All questions carry equal marks. Marks in the margin indicate full marks. Programmable calculators are not allowed. Do not write on this question paper.

1. a) Convert 513.513_{10} to equivalent octal number up to five decimal places. Then convert your result to equivalent hexadecimal and binary bases. 10
- b) Given that, $A = 2176_{10}$ and $B = 2436_{10}$. Find $A-B$ using 2's complement. 05
- c) Write a short note on encoders. 05
- d) Convert the Boolean function $F(x, y, z) = xy + x'z$ as product of maxterm. 05
2. a) Reduce the Boolean expression, $F = (A' + C)(A' + C')(A + B + C'D)$ to a minimum number of literals using basic postulates and theorems. 05
- b) Solve for the Boolean expression $F(A, B, C, D, E) = \sum (0, 2, 4, 5, 8, 11, 14, 16, 19, 20, 25, 26, 27)$ with don't care conditions $K = \sum (1, 29)$ using tabular method. 20
3. a) Find the Boolean expression for F in Fig. 03(a). Draw the full truth table and construct an equivalent circuit containing only NOR gates and verify its operation. 16

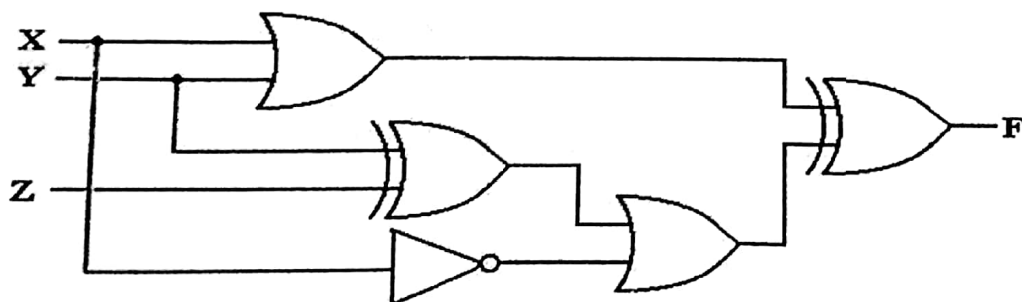


Fig. 03(a)

- b) How can a full adder be constructed from a half adder? Explain the whole process using truth tables and solutions for Boolean expressions with circuit diagrams. 09
4. a) What is carry propagation? Explain the process of carry propagation. 10
- b) Find the Boolean expressions and the circuit diagram to convert any 4-bit binary number to its equivalent gray code. 15