Printed Pages : 3

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BE (3rd Semester)
Examination, Nov.-Dec., 2017

(New Scheme)

Digital Electronics and Logic Design

Time Allowed : 3 hours | *Maximum Marks* : 80
Minimum Pass Marks : 28

Note : (*i*) Part *(a)* of each question is compulsory. Attempt any **two** parts from *(b)*, *(c)* and *(d)* of each question. Answer should be brief and to the point.

(*ii*) The figures in the right-hand margin indicate marks.

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1. *(a)* Why is gray code used in K-map? [2]

(b) A seven-bit Hamming code is received IS 0010001. Assuming that even parity has been used, check of it is correct, if not, find the correct code. [7]

(c) Simplify the logical expression, using K-map
$F = \Pi M$ (0, 2, 5, 7, 8, 10, 13, 15) [7]

(d) Simplify the following Boolean expression, using Quine-McCluskey method : [7]

$F(A, B, C, D, E, F) = \Sigma M\,(20, 28, 52, 60)$

2. (a) What do you mean by Fan-In? [2]

(b) Explain the characteristics of digital IC's. [7]

(c) Explain the Schottky TTL. [7]

(d) Draw the circuit of an C-MOS and explain its operation. [7]

3. (a) What is the difference between binary arithmetic and Boolean algebra addition? [2]

(b) What do you mean by code converter? Explain binary to BCD conversion. [7]

(c) Implement the following Boolean function, using 8 : 1 MUX : [7]

$F(A, B, C, D) = \Sigma M\,(0, 1, 3, 4, 8, 9, 15)$

(d) Explain hook-ahead carry adder. [7]

4. (a) What is the difference between combinational and sequential circuit? [2]

(b) Convert the *R-S* flip-flop to *J-K* flip-flop. [7]

(c) Design a synchronous gray mod–6 counter. [7]

(d) Design a counter by using *T* flip-flop with an irregular binary count sequence of 1, 2, 5, 7. [7]

5. (a) What is the difference between Mealy and Moore machine? [2]

(b) A combinational circuit is defined by the function

$F_1 = \Sigma m\,(1, 5, 7)$

$F_2 = \Sigma m\,(5, 6, 7)$

implement the circuit with a PLA. [7]

(c) Design a Moore sequential machine and perform analysis of these circuit. [7]

(d) Find the type of circuit and analysis the procedure perform these synchronous sequential circuit. [7]