



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3071

Roll No.

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B.Tech

(SEM III) ODD SEMESTER THEORY EXAMINATION 2009-10
PULSE & DIGITAL ELECTRONICS

Time : 3 Hours]

[Total Marks : 100

- Note :** (1) Attempt all questions.
(2) All questions carry equal marks.

1 Attempt any **four** questions : **5×4=20**

- (a) Draw and explain the operation of I^2L inverter.
- (b) Discuss the characteristics of CMOS and ECL family.
- (c) Explain the operation of low and medium power TTL NAND gate.
- (d) Define the following parameters :
 - (i) Fan-out
 - (ii) Noise Margin
 - (iii) Propagation delay
 - (iv) power dissipation.
- (e) Simplify the given boolean function (f) using don't care condition (d) in sum of products to product of sum :



$$f = A'B'D' + A'CD + A'BC$$

$$d = A'BC'D + ACD + AB'D'$$

- (f) Minimize the following boolean function using tabulation method :

$$f(w, x, y, z) = \sum(1, 4, 6, 7, 8, 9, 10, 11, 15)$$

Attempt any **four** questions : 5×4=20

- (a) Perform the subtraction using is complement and 2's complement method.

$$(11010)_2 - (10000)_2$$

- (b) Perform the following :

(i) $(756)_8 - (637)_8 + (725)_{16}$

(ii) Find x if $(193)_x = (623)_8$

- (c) Design the logic and circuit of 4-bit magnitude comparator.

- (d) Draw the circuit of 4-bit adder-subtractor.

- (e) Implement the following boolean function with 8×1 multiplexer :

$$f(A, B, C, D) = \pi M(0, 3, 5, 8, 9, 10, 12, 14).$$

- (f) Implement the following boolean function using PLA :

$$A(x, y, z) = \sum m(1, 2, 4, 6)$$

$$B(x, y, z) = \sum m(0, 1, 6, 7)$$

$$C(x, y, z) = \sum m(2, 6)$$

3 Attempt any **two** questions : 10×2=20

- (a) (i) Realize JK flip flop from SR flip flop
(ii) Draw the state diagram of JK flip flop.
(b) Draw and explain the circuit of bidirectional shift register with parallel load.
(c) What are ripple counters ? What are the disadvantages of ripple counter ? Design a modulo-8 ripple counter.

4 Attempt any **two** questions : 10×2=20

- (a) What is static RAM ? Draw the circuit of Bipolar RAM cell and explain its operation.
(b) Draw and explain RC circuit as differentiator, integrator and compensated attenuator.
(c) What are various types of A/D converters ? Explain any one of them in detail.

5 Attempt any **two** questions : 10×2=20

- (a) Draw and explain Schmitt Trigger. What is the difference between an inverting and a non inverting Schmitt trigger. Give applications of Schmitt trigger.
(b) Draw and explain the astable to monostable configurations of 555 times.
(c) What are advantages of ideal op-amplifier ? Explain the circuit of adjustable voltage IC regulators.