D 70391 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE EXAMINATION, NOVEMBER 2014

AI 09 305—DIGITAL SYSTEMS

Time : Three Hours Maximum : 70 Marks

Part A

Answer **all** *questions.*
Each question carries 2 *marks.*

1. Find 9's complement of 546700.
2. What are the basic laws in Boolean Algebra ?
3. Distinguish between Combinational Circuits and Sequential Circuits.
4. What is Propagation delay ?
5. Define setup time and hold time required of a clocked flip-flop.

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*
Each question carries 5 *marks.*

6. Simplify the following Boolean expression F = AB + (AC)′ + AB′C (AB + C).
7. What is a Decoder ? Explain a 3 to 8 decoder with its truth table and logic diagram.
8. Explain briefly about synchronous counter. How to calculate propagation delay of a synchronous counter ?
9. Explain State Assignment Techniques.
10. Brief about Schottky TTL gates.
11. What is Magnitude Comparator ? Give the combinational circuit for the function F (A>B).

(4 × 5 = 20 marks)

Part C

Answer **all** *questions.*
Each question carries 10 *marks.*

12. (a) (i) Express the function F = (1, 3, 5, 7) as a product of Max terms.

(ii) Express the complement of the above function as a product of min terms.

Or

Turn over

(b) Obtain the minimal sum of product for the function F (A, B, C, D) = Σ (1, 2, 3, 7, 8, 9, 10, 11, 14, 15) by Quine McClusky method.

13. (a) Design a BCD to Decimal Decoder with the use of decoder.

Or

(b) What is a Look Ahead Carry Generator ? What is its importance ? Draw a circuit for a 3-bit binary adder using Look Ahead Carry Generator and other gates.

14. (a) Explain in detail about the operation of Serial Input Serial Output Shift Register.

Or

(b) Design a counter with a following repeated sequence 0 1 2 3 4 5 6.

15. (a) Analyse the synchronous sequential circuit with its state table and state diagram.

Or

(b) What is an Asynchronous sequential circuit ? Explain the basic structural equation and its minimization.

(4 × 10 = 40 marks)