

R09**Code: 9A04504**

B.Tech III Year I Semester (R09) Supplementary Examinations December 2015

DIGITAL IC APPLICATIONS

(Electronics and Communication Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions

All questions carry equal marks

- 1 (a) Design a CMOS transistor circuit with the functional behavior:
$$f(X) = \overline{(A + B)(C + D)}$$

(b) Distinguish between static and dynamic power dissipation of a CMOS circuit. Derive the expression for dynamic power dissipation.
- 2 (a) Draw the circuit diagram of two-input 10K ECL OR gate and explain the circuit.
(b) Explain sinking current and sourcing current of TTL output. Which of the above parameters decide the fan-out and how?
- 3 (a) Explain data-flow design elements of VHDL.
(b) What are the different data objects supported by VHDL? Explain scalar types with suitable examples.
- 4 (a) Give the logic diagram of 74 x 139. Explain with the help of truth table. Using this device design a 3 to 8 decoder and provide the truth table.
(b) Design a 16-bit comparator using 74 x 85 ICs.
- 5 Draw the logic diagram, logic symbol of 74 x 151. And write a VHDL programme using a case statement.
- 6 Explain the operation of a simple floating point encoder with a neat diagram.
- 7 (a) Distinguish between the synchronous and asynchronous counters.
(b) Design a 4 bit ripple down counter using four T flip flops and no other components.
- 8 Draw the block diagram of SRAM with a bidirectional data bus. Explain its operation.
