

Code No: **R31042**

R10

Set No. 1

III B.Tech I Semester Supplementary Examinations, May-2017

DIGITAL IC APPLICATIONS

(Common to Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Bio Medical Engineering, Electronics and Computer Engineering)

Time: 3 hours

Max. Marks: 75

**Answer any FIVE Questions
All Questions carry equal marks**

- 1 a) Draw the circuit diagram, functional table and logic symbol of CMOS OR gate and explain its operation [8]
b) Explain the terms Fan-in and Fan-out of a CMOS Inverter along with circuit diagram [7]
- 2 a) Draw the circuit diagram of two-input 10 K ECL NOR gate and explain the operation of it [7]
b) Explain the following terms with reference to TTL gate [8]
(i) Logic levels (ii) D.C noise margin (iii) Low-state unit load
(iv) High-state fan-out
- 3 a) Design a 16x1 multiplexer using two 74x151 multiplexer and one 74x139 decoder [8]
b) Draw the logic circuit for binary to BCD Code convertor and explain its operation [7]
- 4 a) Draw the block diagram of Binary Adder and Subtractor and explain its operation in detail [10]
b) Write short notes on Dual Priority Encoder in detail [5]
- 5 a) Draw the edge trigger D flip-flop and explain its operation along with timing diagram [8]
b) Design a 4-bit binary synchronous counter using 74x74 and explain its operation in detail [7]
- 6 a) Design an 8-bit parallel-in and serial-out shift register and Explain the operation with the help of timing diagram [8]
b) Write short notes on MSI Shift Registers in detail with one example [7]
- 7 Implement the following Boolean functions using PAL, PLA and PROM [15]

$$f_1(A, B, C, d) = \sum m(0, 1, 2, 4, 6, 8, 10, 12, 15)$$

$$f_2(A, B, C, d) = \sum m(0, 2, 6, 7, 8, 11, 13, 15)$$

- 8 a) Draw the internal circuit diagram of 4T Static RAM and explain its operation. [8]
b) List out few comparisons of SRAM versus DRAM along with advantages and disadvantages. [7]
