Total No. of Questions: 09

B.Tech. (CSE)/(IT) (2011 Onwards) (Sem. – 3)

DIGITAL CIRCUITS & LOGIC DESIGN

M Code: 56593

Subject Code: BTCS-303

Paper ID: [A1125]

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION A

1. Write briefly:
   a) Weighted BCD
   b) Principle of Duality
   c) Exclusive-NOR versus Exclusive-OR
   d) Multiplexer versus Demultiplexer
   e) Uses of Shift Registers
   f) FPGA
   g) Convert 10101_2 to decimal
   h) TTL and CMOS
   i) Number of Gate inputs required for expression: $ABC + A\overline{B}CD + E\overline{F} + AD$
   j) MOSFET

SECTION B

2. Evaluate Following:
   a) Multiply $2A8_{16}$ by $B6_{16}$
   b) Subtract 14 from 46 using 8-bit 2's complement arithmetic.
3. State and prove De-Morgan's Theorems.
4. Explain the Operation of two input TTL NAND gate.
5. Design and implement a 4-bit binary to gray convertor.
6. Distinguish between combinational and sequential switching circuits.

SECTION C

7. Write short note on following
   a) Successive approximation A to D conversion technique
   b) Ripple Carry Adder
8. What are programmable logic devices? What are their advantages? Explain in detail the architecture of a programmable logic device.
9. Using Boolean algebra show that
   a) $AB + \overline{A}C + BC = AB + \overline{A}C$
   b) $AB + \overline{A}C = (A+C)(\overline{A} + B)$