K16U 1198

Reg. No. : .....

Name : .....

II Semester B.C.A. Degree (CCSS – Reg./Supple./Improv.) Examination, May 2016

Core Course

2B02 BCA : DIGITAL SYSTEMS

(2014 Admn. Onwards)

Time : 3 Hours Max. Marks : 40

SECTION – A

1. **One word** answer : **(8×0.5=4 Marks)**
   a) The NOR gate output will be low if the two inputs are _____
   b) The decimal equivalent of the largest number that can be stored in a 4-bit binary counter is _____
   c) Compute $(10100)_2/(1010)_2$ _____
   d) The hexadecimal number 'A0' has the decimal equivalent _____
   e) The Boolean expression A'B + AB' + AB is equivalent to _____
   f) How many flip-flops are required to construct a decade counter ?
   g) The output of SR flip-flop when S = 1, R = 0 is _____
   h) The excess-3 code of decimal 7 is represented by _____

SECTION – B

Write short notes on **any seven** of the following questions : **(7×2=14 Marks)**

2. Define TTL and ECL.
3. Define propagation delay.
4. Design and exclusive OR gate with three inputs.
5. Prove that (X + Y) (X + Z) = X + YZ.

P.T.O.

6. What are multiplexers ? Draw the block diagram of a multiplexer.
7. Distinguish between ROM and PROM.
8. What are synchronous counters ?
9. What are excess-3 codes ?
10. Convert $(AB9)_{16}$ to Octal and $(1136)_8$ to decimal.
11. Define parity generator and parity checker.

SECTION – C

Answer **any four** of the following questions : **(4×3=12 Marks)**

12. State and prove the associative and distributive laws of Boolean Algebra.
13. With relevant diagram explain the working of master-slave JK flip-flop.
14. Design a BCD to Decimal Decoder.
15. Explain the working of a demultiplexer with the help of an example.
16. Draw the logic diagram of a full subtractor using half subtractors.
17. What are decoders ? Draw the truth table and logic diagram of 3 × 8 decoder.

SECTION – D

Write an essay on **any two** of the following questions : **(2×5=10 Marks)**

18. What is a decoder ? Draw the logic circuit of a 3 line to 8 line decoder and explain its working.
19. Simplify using K-map is SOP form.

    $f(A, B, C, D) = \Sigma(0, 2, 8, 9, 10, 11, 14, 15)$. Draw the logic diagram of simplified form.
20. What are counters ? Explain various types of counters with necessary diagrams.
21. What are flip-flops ? Explain different types of triggering of flip-flops with logic diagrams.
