Reg. No. : ....

Name : ....

II Semester B.C.A. Degree (CCSS – 2014 Admn. – Regular) Examination, May 2015
CORE COURSE
2B02 BCA : Digital Systems

Time : 3 Hours

Max. Marks : 40

SECTION – A

1. **One** word answer :

   (8×0.5=4)

   a) In digital computer, _____ is used to represent negative numbers.

   b) The output of a NOR gate is high if all inputs are _____

   c) An octal digit corresponds to _____ binary digits.

   d) A BCD counter has _____ states.

   e) The number of control lines for a 8 to 1 multiplexer is _____

   f) The Gray code for decimal number 6 is equivalent to _____

   g) The device which changes from serial data to parallel data is _____

   h) The excess 3 code of decimal number 26 is _____

SECTION – B

Write short notes on **any seven** of the following questions.

(7×2=14)

2. State and prove commutative law of Boolean algebra.

3. Describe X-OR gate with logic diagram and truth table.

4. Simplify the expression $xyz + xyz' + x'z$.

5. What are synchronous counters ?

6. Convert (110101.101010) to octal and hexadecimal.

7. Define a half adder and full adder.

P.T.O.

8. What is a shift register ? Can a shift register be used as a counter ?

9. What is a demultiplexer ? Discuss the differences between a demultiplexer and a decoder.

10. What is meant by triggering of flip flop ?

11. Explain excess-3 code with examples.

SECTION – C

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

12. Simplify the Boolean expression $xy + x'z + yz$.

13. Distinguish between minterms and maxterms.

14. State and prove Demorgan's laws.

15. Implement a full adder circuit with a decoder and two OR gates.

16. What is a flip-flop ? What is the difference between a latch and a flip-flop ? List out the application of flip-flop.

17. Explain the following conversions with suitable examples :

    a) Decimal to octal

    b) Octal to hexadecimal.

SECTION – D

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

18. What are universal gates ? Construct a logic circuit using NAND gates only for the expression $x = A . (B + C)$.

19. Simplify using K Map in SOP form. $f(A, B, C, D) = \Sigma (0, 2, 8, 9, 10, 11, 14, 15)$.

20. Explain the working of SR flip-flops.

21. Explain with necessary diagram a Mod - 10 Shift Counter with encoding.

———————