**B.Sc. DEGREE (C.B.C.S.S) EXAMINATION, NOVEMBER 2014**
**B.Sc. COMPUTER APPLICATIONS - FIRST SEMESTER**
**CORE PAPER - 1**
**CA1FDS – FUNDAMENTALS OF DIGITAL SYSTEMS**

**Time: 3 Hours**                                                    **Maximum Marks: 80**

## Part A

*Answer **all** questions. Each question carries 1 mark.*

1. The binary number that follows 1011 is
   a) 1111           b) 1110
   c) 1100           d) 1101
2. The hexadecimal number system has a base of
   a) 4              b) 8
   c) 10             d) 16
3. Which of the following is correct?
   a) A.A=1          b) A+1=A
   c) A.1=A          d) A+A'=0
4. The output of a ------- gate is 0 when at least one input is 1.
   a) NAND           b) NOR
   c) XOR            d) AND
5. When both inputs of a JK flip flop are high, and the clock cycles, the output will -------.
   a) be invalid     b) not change       c) remains unchanged       d) toggle
6. A circuit with one input and many outputs is called a ----------.
7. ---------- is an example for a combinational circuit.
8. Asynchronous counters are also called ----------.
9. ----------- is the abbreviation for binary digit.
10. PROM stands for -----------.

                                                                                 (10 x 1 = 10)

## Part B

*Answer any **eight** questions in one or two sentences. Each question carries 2 marks.*

11. Convert $(27)_8$ to binary.
12. What is sign magnitude form?
13. What do you mean by BCD numbers?
14. Perform 11001- 110 in 2's complement method.

                                                                                 **(P.T.O)**

15. Explain NAND gate.
16. What do you mean by don't care conditions?
17. Prove that A + AB= A.
18. What is an encoder?
19. What is the use of DMUX?
20. What is a D-flip flop?
21. What is a shift register?
22. Differentiate between RAM and ROM.

$(8 \times 2 = 16)$

## Part C

*Answer any **six** questions in 50 words each. Each question carries 4 marks.*

23. Discuss the steps to convert a hexadecimal number to octal equivalent. Convert $(AC.2B)_{16}$ to binary.
24. Perform the following additions in BCD:
    a) $(45)_{10} + (27)_{10}$           b) $(81)_{10} + (35)_{10}$
25. Explain SOP and POS expressions.
26. Show that NOR gate is a universal gate.
27. Simplify using K-Map: $F(A, B, C, D) = \quad (1, 2, 3, 8, 9, 10, 11, 14, 15)$
28. Differentiate between half adder and full adder.
29. Construct an 8 * 1 MUX.
30. Explain the working of a simultaneous A/D converter.
31. List the various types of ROM.

$(6 \times 4 = 24)$

## Part D

*Answer any **two** questions in 100 words. Each question carries 15 marks.*

32. Explain popular positional number systems in detail.
33. State and prove De-Morgan's theorems.
34. Explain the working of a synchronous BCD counter with a diagram.
35. Explain PIPO and SIPO shift registers in detail.

$(2 \times 15 = 30)$