E 2219 (Pages : 3) Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2011

Fifth Semester

Core Course —DIGITAL ELECTRONICS

(Common for (1) Model–I Physics (2) Model–II Physics and (3) Physics–EEM)

Time : Three Hours Maximum Weight : 25

Part A

*Answer **all** questions.*
Objective type questions–weight 1 for each bunch.

Bunch-I

Choose the correct answer :

1. A binary digit is called :
   (a) nibble. (b) base.
   (c) radix. (d) a bit.
2. Of the following which is applicable to OR gate :
   (a) two output. (b) one output.
   (c) no output. (d) none of these.
3. A sum of products expression is a :
   (a) binary term. (b) product term.
   (c) additive term. (d) none of these.
4. A master–slave flip flop is a combination of :
   (a) three clocked latches. (b) two clocked latches.
   (c) clocks with reset. (d) none of these.

Bunch-II

5. The octal number system uses :
   (a) 8 only. (b) 0, 1, 2 and 3 only.
   (c) 4, 5, 6, 7 only. (d) eight digits.
6. The purpose of including NOT gate is :
   (a) Inverting (b) non inverting.
   (c) subtraction. (d) none of these.
7. Each term in standard SOP form is called :
   (a) maxterm. (b) minterm.
   (c) term. (d) all the above.

8. A JK flip flop is constructed from an RS flip-flop and :
   (a) three OR gates. (b) two AND gates.
   (c) three AND gates. (d) none of these.

Bunch-III

9. The decimal equivalent of the binary number 1011 is :
   (a) 101. (b) 111.
   (c) 010. (d) 11.
10. The NAND gate is a combination of :
   (a) NOT and AND gates. (b) AND gates.
   (c) NOR gates. (d) AND and NOR gates.
11. Half adder is a logical circuit that performs binary addition of :
   (a) 4 bits. (b) 3 bits.
   (c) 2 bits. (d) none of these.
12. Which of the following is used as memory elements in registers :
   (a) flip-flops. (b) AND gates.
   (c) OR gates. (d) JK.

Bunch-IV

13. In BCD code a decimal digit is represented by :
   (a) one bit. (b) 2 bits.
   (c) 3 bits. (d) 4 bits.
14. The complement of a sum is the product of :
   (a) adjoints. (b) additive inverses.
   (c) complements. (d) all the above.
15. A multiplexer is a circuit with many inputs but :
   (a) only one output. (b) two or more outputs.
   (c) no output. (d) all the above.
16. The maximum count that a counter consisting of four flip flops can do is :
   (a) 4. (b) 14.
   (c) 15. (d) 16.

$(4 \times 1 = 4)$

Part B

Answer **five** *questions.*
(*Short answer questions–Weight* 1 *each*)

17. Convert the (i) octal number 645 to its decimal equivalent (ii) to the binary number 1101110 to octal number.
18. What is a truth table ? Explain the operations of AND gate.
19. State and explain de Morgan's theorems.

20. Find the complement of the expression $X \cdot \overline{Y} + Y \cdot \overline{X}$.
21. Give the functions of a four bit adder-subtractor.
22. With a block diagram explain the function of a decoder.
23. Write a note on registers.
24. What is a latch ? Explain.

(5 × 1 = 5)

Part C

Answer **four** *questions.*
Short essay/problems. Weight 2 each.

25. Bring out the features and limitations of BCD code.
26. The NOT operator is used to change the sense of argument. Establish.
27. Explain how OR gate may be constructed with AND and NOT gates.
28. Give the functioning of a shift encoder.
29. Distinguish between de multiplexers and multiplexers.
30. Give the operation of a MS flip-flop. How it eliminates the race-around condition ?

(4 × 2 = 8)

Part D

Answer **two** *questions.*
Essay-weight 4 each.

31. Give an account on the working of a shift register. List out the various shift registers.
32. Describe how the DAC and ADC are made.
33. Describe the operation of a clocked RS flip flop with the help of a schematic diagram and truth table.

(2 × 4 = 8)