

Reg. No.....Name.....

B.SC. DEGREE END SEMESTER EXAMINATION OCTOBER 2016
SEMESTER - 5: PHYSICS (CORE COURSE)
COURSE: U5CRPHY8 - DIGITAL ELECTRONICS

Time: Three Hours

Max. Marks: 60

PART A (Very short answer questions)(Answer **all** questions. Each question carries 1 Mark)

1. Write four basic rules of binary addition.
2. The 2's complement of 1011 is -----
3. $A+0$ is-----
4. A pair in the Karnaugh map eliminates -----
5. Draw the logic symbol and truth table of XOR gate.
6. A binary counter has eight flip flops. What is the largest binary and decimal number that can be stored in it?
7. What is a binary ladder network?
8. Mention two applications of a flip flop.
9. In a binary system $1 + 1 =$ -----
10. What is mode-n counter?

(1 x 10 = 10)

PART B (Short answer questions)(Answer **any seven** questions. Each question carries 2 Marks)

11. Explain BCD code.
12. Write the basic Boolean laws. Illustrate them with equivalent logic diagrams.
13. State and explain Demorgan's Theorems.
14. Why NAND and NOR gates are called Universal gates. Explain.
15. Write on half adder circuit. Draw its truth table and logic diagram.
16. Explain a four bit subtractor.
17. What are multiplexers?
18. Distinguish between analog and digital signal?
19. Explain the terms rising edge, falling edge, pulse width and rise time.

(2 x 7 = 14)

PART C (Problem/Derivations)(Answer **any four** questions; each question carries 4 marks)

20. Add (a) 1010 and 1101, (b) 1111 and 1011.
21. Reduce the expression (a) $\overline{A}B + \overline{A} + AB$ and (b) $AB + \overline{A}C + A\overline{B}C[AB + C]$

22. A three variable truth table has a high output for the following four input conditions,

| | | |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 0 |

Write the Sum of product equation, reduce it and draw the equivalent circuit.

23. With the aid of circuit diagram explain the working of 16 to 1 multiplexer.

24. Describe how JK flip flop is superior to RS flip flop

25. Describe the operation of Master slave JK flip flop bringing out the need for it.

(4 x 4 =16)

PART D (Long answer questions)

(Answer **any two** questions; each question carries 10 marks)

26. Convert the following:

(a) $(10001100)_2$ to decimal, octal and hexa decimal system.

(b) $(E5)_{16}$ to Decimal, Binary and Octal system.

(c) $(325.736)_8$ to decimal and binary system.

27. What is Karnaugh Map? Write on the different methods of simplification of Karnaugh Map with suitable examples.

28. Design an 8 bit adder and and subtractor. Verify the results using one example.

29. Describe the operation of a Modulo 3 asynchronous ripple counter.

(10 x 2 = 20)
