B.Sc. DEGREE END SEMESTER EXAMINATION OCTOBER/NOVEMBER 2018

SEMESTER –5: PHYSICS (CORE COURSE)

COURSE: 15U5CRPHY08: DIGITAL ELECTRONICS

(Common for Regular 2016 admission & Supplementary 2015 & 2014 admissions)

Time: Three Hours   Max. Marks: 60

PART A (Very short answer questions)

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

1. ……………..   is the radix of decimal number system.
2. Why binary numbers are used in digital electronic systems?
3. State De - Morgan's theorems.
4. What is a flip flop?
5. Draw the logic symbol and truth table of a NOR gate.
6. What is a multiplexer?
7. Define the term 'minterm'.
8. What is meant by propagation delay in a digital circuit?
9. Why synchronous counters are named so?
10. How can you convert an SR flip flop to a D flip flop?   (1 x 10 = 10)

PART B (Short answer questions)

*Answer **any Seven** questions. Each question carries **2** Marks*

11. Convert the octal number 6327.4051 to its decimal equivalent.
12. Implement the logic gates for the following expressions:

    (a) AB + BCD   (b) AB + BCD + EFGH

13. Why Karnaugh maps are used in Boolean algebra?
14. Differentiate between combinational logic circuits and sequential logic circuits.
15. Write a comparative note on DTL and TTL logic families.
16. What is a half adder? In what feature(s) is it different from a full adder?
17. Draw the logic circuit, logic symbol and truth table of a D flipflop.
18. What are digital registers? What are their uses?
19. Explain the terms *rising edge*, *falling edge*, *rise time* and *pulse width*.   (2 x 7 = 14)

PART C (Problem/Derivations)

*Answer **any Four** questions; each question carries **4** marks*

20. What is meant by Coding in digital electronics? Write short note on BCD and ASCII codes.
21. Simplify the following using Boolean algebra

    (a) $(A+B)(A+\overline{B})$ (b) $(A+B)(A+\overline{B})(\overline{A}+\overline{C})$

22. Convert the following expression to the other conical form

F(A,B,C,D) = Π_M (0,1,2,3,4,6,12)

23. Illustrate how a JK flip flop can be converted into a

    (a) D flip flop   and   (b) T flip flop

24. With a neat diagram explain the working of a 4 bit parallel adder.

25. Explain the working of a 4 to 1 multiplexer.   (4 x 4 =16)

PART D (Long answer questions)

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

26. What are 1's complements and 2's complements of a binary number? Find the 1's and 2's complements of the following numbers

    (a) 20   (b) 35   (c) 28

27. (a)What are Karnaugh maps? How a Karnaugh map is constructed?

    (b)How a Boolean expression is implemented in a Karnaugh map?

    (c)How a truth table is implemented in a Karnaugh map?

    (d)How a Boolean expression simplified in a Karnaugh map?

28. What are Registers? Discuss in detail the working of Shift left and Shift right registers.

29. Discuss the construction and working of a counter type ADC.   (10 x 2 = 20)

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