BSc DEGREE (CBCS) EXAMINATION, FEBRUARY 2021

Fifth Semester

Core Course - PH5CRT07 - DIGITAL ELECTRONICS AND PROGRAMMING

B.Sc Physics Model I ,B.Sc Physics Model II Applied Electronics ,B.Sc Physics Model II Computer
Applications,B.Sc Physics Model III Electronic Equipment Maintenance

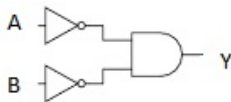2017 Admission Onwards

FD59F4F1

Time: 3 Hours   Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1.   Give the truth table of NOR gate with three inputs.

2.   Find the dual of the function $(\bar{x}y\bar{z} + \bar{x}\bar{y}z = 1)$

3.   Write the other canonical form of $F(A, B, C, D) = \prod(3, 7, 8, 13, 15)$

4.
      Write the truth Table of the following logic circuit.

5.   How does full subtractor work?

6.   What is the use of a Multiplexer?

7.   What is toggling in flip flop?

8.   Why do you need a digital to analog converter?

9.   What do you mean by type casting in C++?

10.   Write part of a C++ code illustrating arithmetic operators.

11.   Give an example for if statement.

12.   What is meant by OOP?

(10×1=10)

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. By using laws of Boolean algebra, Prove that $A(\bar{A} + C)((\bar{A}B + C)(\bar{A}BC + \bar{C}) = 0$

14. Make Karnaugh Map entries for variables F (A, B, C, D) = $\sum$ (0,1,2,3,,8,9,11,12,14,15) and obtain the simplest expression for F.

15. With neat sketches of logic diagram and timing diagrams, explain the operation of master-slave JK flip-flop.

16. With the neat sketches, explain SIPO registers.

17. Why do you need to convert analog to digital? Explain any one of the ADC.

18. Write a C++ code to display the output the text `Computational Physics` on a new line.

19. Describe int, short and char datatypes.

20. State difference between while and do.. while?

21. Give a C++ code segment to access the nth element of an integer array.

$(6\times5=30)$

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. Simplify the expression $Y = \bar{A}.\bar{B}.\bar{C} + \bar{A}.\bar{B}.C + \bar{A}.\bar{C}$ and implement it using only NOR gates.

23. What is decoder and encoder? Explain with example.

24. What is a counter? Draw and explain the operation of Mod-8 ripple counter. What are the applications of counters?

25. (a) What are constants and how are they declared in C++? Mention its types with examples.
    (b) What is an escape sequence? Give examples and explain when they are used?

$(2\times10=20)$