22103397

QP CODE: 22103397

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, NOVEMBER 2022

Fifth Semester

CORE COURSE - PH5CRT07 - DIGITAL ELECTRONICS AND PROGRAMMING

Common for 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

85542E86

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. Symbolically represent two input NOR gate.
2. State the basic AND relations in Boolean algebra using 'A' as one variable.
3. Draw the logic diagram to implement the Boolean expression $F = X(Y \oplus Z) + \bar{V}$
4. Briefly explain ‘minterm’.
5. What is the principle of Demultiplexer?
6. What are the applications of Flip-Flops?
7. What is serial in Parallel out register?
8. Why do you need a digital to analog converter?
9. Name the << operator in C++.
10. Can unsigned int datatype be used to store the number 50,000? Why?
11. What do you meant by variables in a C++ program?
12. What is meant by encapsulation in OOP?

(10×1=10)

Part B

*Answer any **six** questions.*

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

13. (a) State second De-Morgan's theorem and implement the logic circuit.
    (b) Find the complement of the function F = (AB+CD), then show that $F\bar{F} = 0$

14. Draw the K-Map for the Boolean function
    $F = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}B\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + \bar{A}B\bar{C}D + \bar{A}\bar{B}C\bar{D}.$
    Obtain the simplified expression for F.

15. What is subtractor? What is half subtractor? Explain

16. How does a decoder circuit work? Explain with example.

17. Draw the logic circuit and truth table for a clocked JK flip-flop. Explain its operation

18. Write short notes on relational operators in C++.

19. Write a C++ code segment to check whether the given number is completely divisible by 5 or 10 and display the result.

20. How do you declare an array in C++?

21. What is function overloading? Illustrate using an example.

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. (a) Obtain the truth table and logic circuit for the Boolean function
    $F = \bar{x}\bar{y}z + \bar{x}yz + x\bar{y} + xz.$ Simplify the function using Boolean identities and draw the logic circuit for the same.
    (b) A sensor has three inputs A, B, C. Get the Boolen Equation for the sensor output.

sensor inputs

A	B	C	Output
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

23. What is a counter? With neat sketches, explain binary ripple counter. What are the applications of counters?

24. Explain the principle of A/D converters. Explain counter type A/D converter. What are the application of ADC?

25. Write a C++ program to find the sum of even numbers between 0 and 100.

(2×10=20)