T – 1630

Reg. No. : ....

Name : ....

Sixth Semester B.Sc. Degree Examination, April 2024

First Degree Programme under CBCSS

Physics

Core Course XII

PY 1644 : DIGITAL ELECTRONICS AND COMPUTER SCIENCE

(2018 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions in **one** or **two** sentences. Each question carries **1** mark.

1. Convert the binary number 1110010_2 to hexadecimal number.

2. Give the number of cells in an n-variable K-Map.

3. How will you define a variable in C++?

4. Give an example of single line comment in C++.

5. What '\t' means in C++?

6. State the duality theorem.

7. State whether 1010 is a BCD. Why?

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8. Represent the given binary numbers in 1's complement form

   (a) 11110_2

   (b) 101010_2

   (c) 0000011_2

9. What is meant by cache memory?

10. Symbolically represent two input NOR gate.

   (10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions, not to exceeding a paragraph. Each question carries **2** marks.

11. Evaluate using binary arithmetic

   (a) $110_2 + 011_2$

   (b) $11010_2 + 0111_2$

   (c) $110_2 - 010_2$

   (d) $1011_2 - 1110_2$

12. Differentiate array and structure in C++.

13. What is an exit controlled loop?

14. What is an asynchronous DRAM?

15. What is a subtractor? Explain.

16. Give the truth table of EXOR gate.

17. What is mean by edge triggered flip flops?

18. Explain the difference between the 1's complement and 2's complement methods by considering the binary subtraction of the decimal number 20 from 25.

19. Why ASCII codes are needed?

20. How will you define an inline function in C++?

21. Name any four addressing modes in 8085 microprocessor.

22. Can unsigned int datatype be used to store the umber 50,000? Why?

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions. Each question carries **4** marks.

23. Subtract the decimal number 125 from 200 using 2's complement binary operation. Express the numbers in hexadecimal.

24. Write brief notes on functions in C++.

25. Distinguish between assembly language and machine language.

26. Draw the K-Map for the Boolean function F = A'B'C'D' + A'BC'D' + A'B'C'D + A'BC'D + A'B'CD'. Obtain the simplified expression for F.

27. Briefly explain the working of SR flip-flop.

28. Distinguish between the terms declaration, definition and initialization as applied to variables in C++.

29. How is virtual memory different from cache memory?

30. Contrast between relational and logical operators in C++.

31. Write a C++ code segment to display a matrix.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions. **Each** question carries **15** marks.

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

33. (a) Write down the procedure to convert binary number to hexadecimal numbers.

    (b) Discuss the steps involved in subtracting smaller number from bigger number and vice versa in 2's compliment form.

    (c) Subtract the following hexadecimal numbers and express the results in binary numbers:

        (i) $F_H - 4_H$

        (ii) $1C_H - 20_H$

        (iii) $AA_H - 11_H$

34. Obtain the truth table and logic circuit for the Boolean function $F = x'y'z + x'yz + xy' + xz$. Simplify the function using Boolean identities and draw the logic circuit for the same.

35. Distinguish between Basic and Universal gates with their standard symbols and truth tables. Why are they called so? Prove that NAND and NOR are Universal gates.

(2 × 15 = 30 Marks)

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