

(Pages : 4)

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Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, March 2021

First Degree Programme under CBCSS

Physics

Core Course XII

PY 1644 – DIGITAL ELECTRONICS AND COMPUTER SCIENCE

(2018 Admission Regular)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions. **Each** carries **1** mark.

1. What are the basic logic gates?
2. What is the purpose of NOT gate?
3. What are arrays?
4. What are functional declarations?
5. What are array initializations in C++?
6. Define cache memory.
7. What is the use of magnetic hard disks?
8. What do you mean by flip flop?

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9. What is meant by a program?
10. List the flags of 8085.

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. **Each** carries **2** marks.

11. $X_{10} = (11001001)_2$, $X = \text{_____}$.
12. The solution to the quadratic equation is $x^2 - 11x + 22 = 0$ is $x = 3$ and $x = 6$. What is the base of the numbers?
13. What is K - map? Explain the advantages of K - map.
14. What is the importance of semiconductors in computer?
15. What are the elements in the memory process?
16. Explain RAM and ROM.
17. What is mean by conditional operator?
18. Difference between continue statement and break statement.
19. Give the syntax for else if.
20. What do you mean by classes and object?
21. Write a short note on register addressing and register indirect addressing.
22. Write the features of 8085 microprocessor.
23. What is the function of microprocessor in a system?
24. What is a microcontroller?
25. What is interrupt?
26. Write the importance of register A in 8085 microprocessor.

(8 × 2 = 16 Marks)

SECTION - C

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

27. Implement the Boolean function $F = AB + A'B' + B'C$:

- (a) With AND, OR, and inverter gates, and
- (b) With NOR and inverter gates.

28. Simplify the expressions using Boolean postulate:

$$XY + \overline{XZ} + X\overline{Y}Z (XY + Z) = 1$$

29. What are floating points in C++?
30. Explain control units.
31. Difference between OR gate and AND gate.
32. What is flash memory? Explain different flash memory.
33. Write a program using ADI instruction to add the two hexadecimal numbers 23 H and 1C H.
34. Write a short note on various level of programming.
35. Write a note on 8-bit microprocessors.
36. Explain half adder.
37. Simplify the given logic equation by using K-map:
- $$Y = A'B'CD + A'BC'D' + A'BC'D + A'BCD + A'BCD' + ABCD' + ABC'D' + ABC'D + ABCD$$
- $$+ AB'C'D' + AB'CD'$$
38. Explain half subtractor.

(6 × 4 = 24 Marks)

SECTION - C

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

27. Implement the Boolean function $F = AB + A'B' + B'C$:

(a) With AND, OR, and inverter gates, and

(b) With NOR and inverter gates.

28. Simplify the expressions using Boolean postulate:

$$XY + \overline{XZ} + X\overline{Y}Z (XY + Z) = 1$$

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35. Write a note on 8-bit microprocessors.

36. Explain half adder.

37. Simplify the given logic equation by using K-map:

$$Y = A'B'CD + A'BC'D' + A'BC'D + A'BCD + A'BCD' + ABCD' + ABC'D' + ABC'D + ABCD \\ + AB'C'D' + AB'CD'$$

38. Explain half subtractor.

(6 × 4 = 24 Marks)

SECTION – D

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

[For partial answers reduce marks accordingly]

39. Perform the subtraction with the following binary numbers using 1's complement. Check the answer by straight subtraction.
- (a) $110101 - 100101$
 - (b) $101011 - 111001$
 - (c) $1011.001 - 110.10$
 - (d) $10110.01 - 11010.10$
40. Describe in details about the pin configuration of 8085 microprocessor and its functions.
41. Give the detailed explanation of hardware and software of the computer.
42. Give the basic concept of memory systems in computer. Explain the structure of large memories.
43. What are the different types of operations in C++?
44. What are full adders? Draw the circuit diagram and summarize the circuit action using truth table.

(2 × 15 = 30 Marks)
