(Pages : 3) N – 1317

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Sixth Semester B.Sc. Degree Examination, April 2022

First Degree Programme under CBCSS

Physics

Core Course XII

PY 1644 : DIGITAL ELECTRONICS AND COMPUTER SCIENCE

(2014 & 2017 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions, each carries **1** mark.

1. What is a nibble?
2. An inverter is known as NOT gate. Why?
3. What is a Karnaugh map?
4. What is interpolation?
5. What is regression analysis?
6. What is the essentiality of numerical differentiation methods?
7. Explain the function of ALU
8. What are the main features of C language?
9. Mention the operations done by the function *fopen()*.
10. Pointers can be used to access and manipulate data stored in the memory. How?

(10 × 1 = 10 Marks)

P.T.O.

SECTION – B

Answer any **eight**, each carries **2** marks.

11. Explain the features of ASCII code

12. Convert the decimal number 212 to hexadecimal and binary.

13. Draw the symbols of a NOR gate and a bubbled AND gate and show that both have the same function.

14. Write an algorithm for linear regression.

15. Explain the features of Runge Kutta methods.

16. Compare bisection and Newton- Raphson methods.

17. Distinguish between dynamic and static RAM

18. Explain the features of the essential parts of a main() function section.

19. How do variables and symbolic names differ?

20. Explain the statement scanf("%s %d %f", item, &partno, &cost);

21. Compare arrays and structures.

22. Convert the binary 10101.1101 to its decimal equivalent.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six**, each carries **4** marks.

23. Describe the working of a JK flip flop.

24. Simplify the Boolean $Y = \overline{A}\,\overline{B}\,\overline{C} + \overline{A}B\overline{C} + A\overline{B}\,\overline{C} + AB\overline{C}$ and draw the logic circuit.

25. Which gates are known as the universal building blocks? Explain this by implementation.

26. Compute the integral $\int_0^{\pi/2} \sqrt{\sin x}\,dx$ using Simpson's 1/3 rule for n=4.

27. Given the equation $\frac{dy}{dx} = 3x^2 + 1$ with $y(1) = 2$, estimate $y(2)$ by Euler's method using $h = 0.5$ and $h = 0.25$ and hence explain the features of this method.

28. Explain why we need operating systems by considering some major facilities provided by them.

29. Write a program to convert the given temperature in degree Celsius to Fahrenheit and Kelvin.

30. Write a programme to convert a given number of days into years, months and days.

31. Give the general form of *if - else* statement and explain it.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two,** each carries **15** marks.

32. Explain the difference between the 1's complement and 2's complement methods by considering the binary subtraction of the decimal number 200 from 125. Also explain the working of an adder- subtracter.

33. Explain the principle of the bisection method and write its algorithm. Solve $x^3 - 9x + 1 = 0$ for the root between $x = 2$ and $x = 4$ by bisection method.

34. Discuss about various secondary memory storage systems.

35. Explain the various classes of data types.

(2 × 15 = 30 Marks)
