21COAC101 Reg No : .....

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME

BCA FIRST SEMESTER DEGREE EXAMINATION MARCH 2022

COMPUTER APPLICATIONS

Fundamentals of Computers - Theory

Duration:2 Hours **Max Marks:60**

PART A

Answer any FIVE questions: **(5×2= 10)**

1) What is a dotmatrix printer?
2) What is a low level programming language?
3) List the various logical gates.
4) Define gate in boolean algebra.
5) Add binary numbers 10111 and 1111 .
6) How to represent XOR and XNOR gate in digital electronics?

PART B

Answer any FIVE questions : **(5×6= 30)**

7) Explain the components of a computer system with neat diagram.
8) Write an algorithm to check whether the given number is prime or not.
9) Find 10011 - 10110 using 1's complement and 2's complement.
10) Verify DeMorgans first law using truth table.
11. Write a short note on a) keyboard b) mouse .
12. Convert the following octal numbers a) 456 b) 367 c) 574 to binary

PART C

Answer any TWO questions : **(2×10= 20)**

13. Write a note on a) Micro computer b) Mini computer c) Main frames.
14. What is a) system software b) application software? Explain with example.
15. What is K-Map?
    Write a note on a) four variable k-map b) three variable K-map with example

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21COAC102 Reg No : .....

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME

BCA FIRST SEMESTER DEGREE EXAMINATION MARCH 2022

COMPUTER APPLICATIONS

Programming in C - Theory

Duration:2 Hours **Max Marks:60**

PART A

Answer any FIVE questions: **(5×2= 10)**

1) What is C character set? Give an example.
2) Write the syntax of nested if-else in C.
3) How do you initialize a string variable in C? Give an example.
4) Define union. Give an example.
5) What is conditional operator? Write its syntax.
6) How do you initialize strings using pointers?

PART B

Answer any FIVE questions : **(5×6= 30)**

7) Differntiate between a) getchar() and gets() b) putchar() and puts()
8) Explain while loop with syntax and example.
9) Explain linear search with example.
10) Write a C program to calculate and display the first 'n' Fibonacci numbers.
11. Define structure? Explain with its syntax and example.
12. Explain a) scanf() b) printf()

PART C

Answer any TWO questions : **(2×10= 20)**

13. a) Explain the basic structure of C programming language with an example.
    b) Explain any five features of C Programming language
14. Write a note on a) Precedence of arithmetic operators b) Arithmetic expressions
15. Explain with syntax and example a) strcat() b) strlen() c) strcpy()

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21COAC103 **Reg No : .....**

CHOICE BASED CREDIT SYSTEM SEMESTER SCHEME
B.C.A FIRST SEMESTER DEGREE EXAMINATION MARCH 2022
COMPUTER APPLICATIONS
Mathematical Foundation

Duration: 2 Hours **Max Marks: 60**

PART - A

Answer any SIX of the following: **6×2= 12**

1. If $A = \begin{bmatrix} 2 & -3 & 1 \\ 4 & 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -2 & 4 \\ 1 & 3 & -5 \end{bmatrix}$, then show that $(A+B)^t = A^t + B^t$.

2. Show that (i) $\begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix} \cdot \begin{vmatrix} 5 & 6 \\ 7 & 8 \end{vmatrix} = 4$ (ii) $\begin{vmatrix} a & b \\ c & d \end{vmatrix} + \begin{vmatrix} b & q \\ p & c \end{vmatrix} + \begin{vmatrix} p & d \\ a & q \end{vmatrix} = 0$

3. If the area of the triangle formed by the points $(k,0)$, $(-1,2)$ and $(4,3)$ is 12 square units, find k.

4. Show that the lines $3x + 4y - 8 = 0$ and $15x + 20y - 23 = 0$ are parallel.

5. Find the ratio in which the line joining the points $(3,4)$ and $(7,11)$ is divided by the point $(-1,3)$.

6. Find the slope of the line joining the points:
   (i) $A(1,-7)$ and $B(2,3)$
   (ii) $A(\frac{1}{2}, \frac{2}{3})$ and $B(\frac{1}{3}, \frac{-1}{2})$

7. Express $30'$ in radians.

8. (i) If $y = x^{-8}$, then find $\frac{dy}{dx}$
   (ii) If $y = 2x + x^2$, then find $\frac{dy}{dx}$

PART - B

Answer any TWO of the following: **2×6= 12**

9. Solve the system of equations by using Cramer's Rule :
   $x + 2y + z = 4$
   $x - y + z = 5$
   $2x + 3y - z = 1$

10. Find the adjoint of the matrix $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$.

11. Solve the system of equations by using Matrix method :
    $x - y + z = 2$
    $3x - y + 2z = -6$
    $3x + y + z = -18$

PART - C

Answer any TWO of the following: **2×6= 12**

12. Find the characteristic equation of the matrix :

(i) $A = \begin{bmatrix} 1 & -1 & 1 \\ 0 & 1 & 0 \\ 1 & -1 & 1 \end{bmatrix}$ (ii) $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -1 & 3 \end{bmatrix}$

13. Show that the matrix $A = \begin{bmatrix} 1 & -1 & 1 \\ 0 & 1 & 0 \\ 1 & -1 & 1 \end{bmatrix}$ satisfies its characteristic equation.

14. Reduce the matrix $A = \begin{bmatrix} 1 & 3 & 4 & 3 \\ 3 & 9 & 12 & 9 \\ -1 & -3 & -4 & -3 \end{bmatrix}$ to it's normal form and find the rank.

PART - D

Answer any TWO of the following: **2×6= 12**

15. If the midpoints of the sides of a triangle are $(-1, 2), (6, 1)$ and $(3, 5)$. Find the co-ordinates of the vertices .

16. Show that the points $A(4, -5), B(8, 1), C(14, -3)$ and $D(10, -9)$ taken in order are the vertices of a square.

17. Find the angles of the triangle ABC where $A(-4, 2), B(12, -2), C(8, 6)$.

PART - E

Answer any TWO of the following: **2×6= 12**

18. Find the maximum and minimum values of the function $x^3 - 2x^2 - 4x - 1$.

19. If $\sec\theta = \frac{13}{5}$, θ is acute . Find the values of the trignometric functions of θ. Find the value of $\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta}$.

20. Find $\lim\limits_{x \to 1} \frac{\sqrt{3+x} - \sqrt{5-x}}{x^2 - 1}$.

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