

K22U 1247

Reg. No. :

Name :

**II Semester B.C.A. Degree (C.B.C.S.S.-O.B.E. – Regular/Supplementary/
Improvement) Examination, April 2022
(2019 Admission Onwards)
Core Course**

2B03BCA : OBJECT ORIENTED PROGRAMMING USING C++

Time : 3 Hours

Max. Marks : 40

**PART – A
(Short Answer)**

Answer **all** questions :

(6×1=6)

1. Which feature of the OOPS gives the concept of reusability ?
2. Which is the default return value of functions in C++ ?
3. Which data type specifies an empty set of values/parameters ?
4. _____ is the scope resolution operator.
5. Variables declared inside the class are known as _____
6. What do you mean by object ?

**PART – B
(Short Essay)**

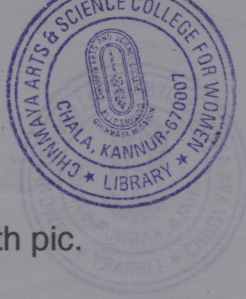
Answer **any 6** questions :

(6×2=12)

7. What is an identifier ? What are the rules to follow its naming ?
8. What is function overloading ?
9. What is nesting of member functions ?
10. What do you mean by destructor ?

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11. Explain multiple inheritance with pic.
12. Mention put() and get() functions.
13. Explain arrays.
14. How to declare a variable ?

**PART – C
(Essay)**

Answer **any 4** questions :

(4×3=12)

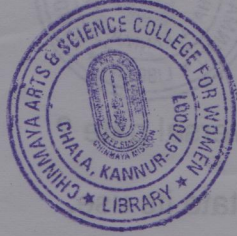
15. Differentiate Data Abstraction and Encapsulation.
16. Differentiate call by value and call by reference.
17. Mention the specialties of constructor functions.
18. Explain virtual functions and pure virtual functions.
19. Explain the functions for manipulation of file pointers.
20. Write a C++ program to print Fibonacci series.

**PART – D
(Long Essay)**

Answer **any 2** questions.

(2×5=10)

21. Explain the data type hierarchy in C++.
22. Explain different types of inheritances in C++.
23. Explain the following :
 - a) Opening and closing of files 2
 - b) Classes of file stream operations. 3
24. Mention merits and demerits of Procedure oriented programming and Object oriented programming.



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Improvement) Examination, April 2022
(2019 Admission Onwards)
Core Course
2B02BCA : DIGITAL SYSTEMS**

Time : 3 Hours

Max. Marks : 40

PART – A

Answer **all** questions. **Each** question carries **one** mark.

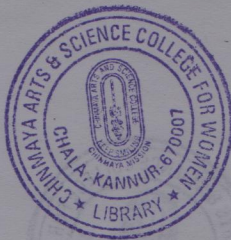
1. Give the base value and numbers of hexadecimal number system.
2. How many flip flops are needed for MOD 7 counter ?
3. In which input condition JK Flip Flop generates toggle output condition ?
4. Mention the number of input and output of demultiplexer.
5. List one example for sequential for a sequential circuit.
6. Specify any one error detection code.

PART – B

Answer **any six** out of eight. **Each** question carries **two** marks.

7. What is full adder ?
8. What is demultiplexer ?
9. What is latch ?
10. What are up/down counter ?
11. What is a register ?

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12. Why NAND is known as a universal gate ?
13. Define a Karnaugh map and state its use.
14. Draw the block diagram of clocked RS flip-flop.

PART – C

Answer **any four** out of six. **Each** question carries **three** marks.

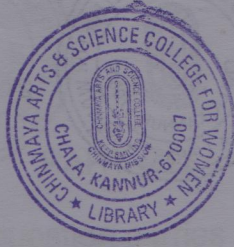
15. What is a flip flop ?
16. Explain different types of shift registers.
17. State the laws and rules of Boolean algebra.
18. Show the steps in converting a binary number to its equivalent gray code .
19. Give the logic symbol of Master Slave J-K flip-flop.
20. Give the timing diagram for 3 bit synchronous counter.

PART – D

Answer **any two** out of four. **Each** question carries **five** marks.

21. Describe different types of gates with truth tables.
22. Explain Demultiplexer with logic diagram.
23. Write notes on full adder.
24. Explain mod 10 Asynchronous counter.

14-09-22



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Reg. No. :

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**II Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/Improvement) Examination, April 2022
(2019 Admission Onwards)**

**COMPLEMENTARY ELECTIVE COURSE IN MATHEMATICS
2C02 MAT – BCA : Mathematics for BCA II**

Time : 3 Hours

Max. Marks : 40

PART – A

Answer **any four** questions. **Each** question carries **1** mark.

1. If z is a homogeneous function of degree n in x and y , then find

$$x^2 \frac{\partial^2 z}{\partial x^2} + 2xy \frac{\partial^2 z}{\partial x \partial y} + y^2 \frac{\partial^2 z}{\partial y^2}.$$

2. Find the value of $\int_0^{\frac{\pi}{2}} \sin x \, dx$.

3. Evaluate $\int \frac{dx}{2x-5}$.

4. Find the Cartesian equation of the polar equation $r = 2$.

5. Calculate the eigenvalues of a diagonal matrix. **(4×1=4)**

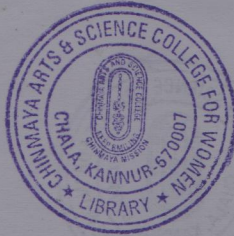
PART – B

Answer **any seven** questions. **Each** question carries **2** marks.

6. State Euler's theorem on homogeneous function.

7. Find the value of $\lim_{\substack{x \rightarrow 1 \\ y \rightarrow 2}} \frac{3x^3y}{x^2 + 2y^2 + 4}$.

P.T.O.

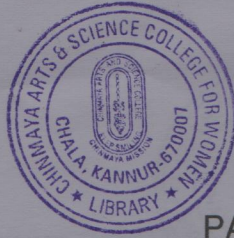


8. Evaluate $\int_0^1 \frac{2x}{1+x^2} dx$.
9. What is the reduction formula for $\int \tan^n x dx$?
10. Evaluate $\int x \cos x dx$.
11. Find the value of $\int_1^2 \int_0^4 xy dy dx$.
12. Sketch the region of integration $0 \leq x \leq 3, 0 \leq y \leq 2x$.
13. Define eigenvectors.
14. What is meant by similarity of matrices ?
15. Find the matrix corresponding to the quadratic form $3x^2 + 5y^2 + 3z^2 - 2yz + 2zx - 2xy$. (7×2=14)

PART - C

Answer **any four** questions. **Each** question carries **3** marks.

16. Find the value of $\frac{du}{dt}$, given $u = y^2 - 4ax$, $x = at^2$ and $y = 2at$.
17. Evaluate $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ if $z = x^2y - x \sin xy$.
18. Find the value of $\int_0^1 \frac{x^5}{\sqrt{1-x^2}} dx$.
19. Evaluate $\int_{-10}^1 \int_0^1 \int_0^2 (x+y+z) dx dy dz$.
20. Find a polar equation for the circle $(x-3)^2 + (y+1)^2 = 4$.
21. Calculate the eigenvalues and eigenvectors of the matrix $\begin{bmatrix} 10 & 3 \\ 4 & 6 \end{bmatrix}$.
22. Classify the nature of a quadratic form X^TAX . (4×3=12)



PART - D

Answer **any two** questions. **Each** question carries **5** marks.

23. If $u = \sin^{-1}\left(\frac{x^2 + y^2}{x + y}\right)$, prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \tan u$.

24. Integrate $\frac{x+1}{(x-1)^2(x+2)^2}$ with respect to x .

25. Calculate $\iint f(x, y) \, dA$ over $R : 0 \leq x \leq 2, -1 \leq y \leq 1$, where $f(x, y) = 100 - 6x^2y$.

26. Using Cayley Hamilton theorem find the inverse of the matrix $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$. Also

express $A^5 - 4A^4 - 7A^3 + 11A^2 - A - 10I$ as a linear polynomials in A .

(2x5=10)