



Reg. No. :

Name :



K20U 0947

IV Semester B.C.A. Degree (CBCSS-Reg./Sup./Imp.) Examination, April 2020
(2014 Admn. Onwards)

General Course
4A14BCA : NUMERICAL ANALYSIS

Time : 3 Hours

Max. Marks : 40

SECTION - A

1. One-word answer. (8×0.5=4)
- A graph containing only isolated nodes is called a _____ graph.
 - "If p then q" is called a _____ statement.
 - The Newton-Raphson method of finding roots of nonlinear equations falls under the category of _____ methods.
 - The connective NAND is denoted by _____.
 - The first forward difference is given by _____.
 - A product of the variable and their negations in a formula is called an _____ product.
 - The number of edges appearing in the sequence of a path is called the _____ of the path.
 - The linear interpolation formula is given by _____.

SECTION - B

Write short notes on **any seven** of the following questions. (7×2=14)

- Define converse, inverse and contrapositive of any statement formula $p \rightarrow q$.
- What do you mean by adjacency matrix of a graph G ?
- Explain disjunctive normal forms in mathematical logic.
- Write down two different approaches for solving systems of linear algebraic equations.
- Define a simple graph. Give an example.
- Find the Newton-Raphson method formula for finding the square root of a real number R from the equation $x^2 - R = 0$.

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8. Expand a function $y(x)$ about a point $x = x_0$ using Taylor's theorem of expansion.
9. The relative error is defined as $e_r =$
10. Define a directed tree.
11. The table below gives square roots for integers.

x	1	2	3	4	5
f(x)	1	1.414	1.7321	2	2.2361

Determine the square root of 2.5 using linear interpolation formula.

SECTION - C

Answer **any four** of the following questions.

(4x3=12)

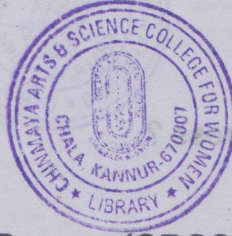
12. Show that $p \rightarrow (q \rightarrow p) \equiv \sim p \rightarrow (p \rightarrow q)$.
13. Compute the integral $I = \int_{-2}^2 e^{\frac{-x}{2}}$ using Gaussian two point formula.
14. Construct the truth table of conditional and biconditional statements.
15. Solve the following system of equations by the process of elimination.
- $$3x + 2y + z = 10$$
- $$2x + 3y + 2z = 14$$
- $$x + 2y + 3z = 14$$
16. Define accuracy and precision of a number.
17. Derive Lagrange interpolation polynomial.

SECTION - D

Write an essay on **any two** of the following questions.

(2x5=10)

18. Obtain the principal disjunctive normal form of $(p \wedge q) \vee (\sim p \wedge r) \vee (q \wedge r)$.
19. Solve the differential equation $\frac{dy}{dx} + xy = 0$, $y(0) = 1$ from $x = 0$ to $x = 0.25$ using Euler's method.
20. Determine the root of the given equation $x^2 - 3 = 0$ for $x \in [1, 2]$ using bisection method.
21. Find the root of the equation $f(x) = x^2 - 3x + 2$ in the vicinity of $x = 0$ using Newton-Raphson method.



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IV Semester B.C.A. Degree (CBCSS-Reg./Sup./Imp.)

Examination, April 2020

(2014 Admn. Onwards)

Core Course

4B08 BCA : OPERATING SYSTEM

Time : 3 Hours

Max. Marks : 40

SECTION – A

1. **One word answer.** (8×0.5=4)

a) _____ refers to a situation in which a process is ready to execute but is continuously denied access to a processor in deference to other processes.

b) _____ scheduling policy is most suitable for time shared operating systems.

c) _____ technique can be used to resolve conflicts, such as competition for resources and to synchronize processes so that they can cooperate.

d) The number of processes completed per unit time is known as _____

e) Fixed partition memory management largely face the problem of _____

f) Degree of multiprogramming is controlled by _____ scheduler.

g) Physical memory is broken into fixed size blocks called _____

h) _____ UNIX command is used to list files from the directory.

SECTION – B

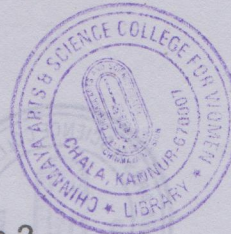
Write short notes on **any seven** of the following questions. (7×2=14)

2. What is PCB ?

3. What is multiprogramming ?

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4. What is meant by physical address ?
5. What is demand paging ?
6. Define thread.
7. What is Belady's Anomaly ?
8. When is a system in safe state ?
9. What is page fault ?
10. What is shell in UNIX ?
11. Which command is used to 1) remove a directory 2) remove a file ?

SECTION - C

Answer **any four** of the following questions. (4×3=12)

12. What are different types of operating systems ? Explain in detail.
13. Define process. What are various states of a process ?
14. Differentiate long term and short term scheduler.
15. Discuss the concept of demand paging.
16. Write short note on I/O traffic controller.
17. What are the file types available in Unix ?

SECTION - D

Write an essay on **any two** of the following questions. (2×5=10)

18. What is deadlock ? What are the necessary conditions for the occurrence of a deadlock ?
19. Explain about nonpreemptive process scheduling policies.
20. Discuss paged memory management scheme in detail.
21. Explain the hierarchical model of a file system.



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IV Semester B.C.A. Degree (CBCSS-Reg./Sup./Imp.) Examination, April 2020
(2014 Admn. Onwards)
Core Course
4B09BCA : JAVA PROGRAMMING

Time : 3 Hours

Max. Marks : 40

SECTION - A

1. **One word answer.**

(8×0.5=4)

- AWT stands for _____
- _____ Provides an default implementation of all methods in an event.
- A _____ is an object that is notified when an event occurs.
- In order to fill an ellipse _____ method can be used.
- Using _____ one can specify what a class must do, not how it does it.
- The implicit return type of a class's constructor is _____ itself.
- _____ is the super class of all events.
- _____ is an interpreter for bytecode.

SECTION - B

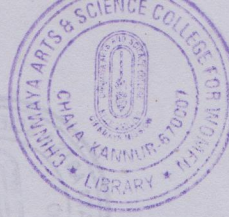
Write short notes on **any seven** of the following question.

(7×2=14)

- What is a thread in Java ?
- What is the use of finally clause in Java ?
- Define stream.
- Define constructor overloading.
- What is the need of abstract class in Java ?
- What is an applet and applet class ?
- Short note on synchronization in multithreading.
- Difference between text field and text area.
- List any 5 event listener interface in Java.
- Define operator overloading.

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SECTION - C

Answer **any four** of the following questions.

(4×3=12)

12. Explain applet skeleton.
13. Write a short note on features of adapter class in Java.
14. Explain various use of final keyword.
15. What is meant by listener interface ? Explain key listener.
16. Write a note on multiple inheritance.
17. What is the significance of the keyword 'super' in Java ?

SECTION - D

Write an essay on **any two** of the following questions.

(2×5=10)

18. Write a program for matrix addition.
19. Explain exception handling in Java.
20. How will you obtain graphics context in window ? Explain various drawing method of graphics class.
21. Define an applet, parameters passed to an applet. Explain with an example program.

SECTION - B

(7×2=14)

Write short notes on **any seven** of the following questions.

1. What is a thread in Java ?
2. What is the use of finally clause in Java ?
3. Define stream.
4. Define constructor overloading.
5. What is the need of abstract class in Java ?
6. What is an applet and applet class ?
7. Short note on synchronization in multithreading.
8. Difference between text field and text area.
9. List any 5 event listener interface in Java.
10. Define operator overloading.

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Reg. No. :

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**IV Semester B.C.A. Degree (CBCSS – Reg./Sup./Imp.)
Examination, April 2020
(2014 Admn. Onwards)
Core Course
4B10BCA : LINUX ADMINISTRATION**

Time : 3 Hours

Max. Marks : 40

SECTION – A

1. **One word answer :** **(8×0.5=4)**
- a) What does Grep() stand for ?
 - b) _____ command is used to change password of a user.
 - c) In which directory we can find network configurations ?
 - d) _____ command will allows a user with proper permissions to execute a command as another user.
 - e) The _____ command can be used in Linux to add user groups to the system.
 - f) What is the use of chmod command ?
 - g) What is a 'hard link' ?
 - h) What is "comm" used for ?

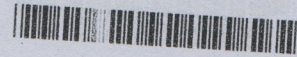
SECTION – B

Write short notes on **any seven** of the following questions : **(7×2=14)**

- 2. Explain CLI.
- 3. What are the different functionalities and responsibilities of a Linux System Administrator ?
- 4. What is umask and what is its use in Linux ?
- 5. What is the routing table in Linux ?

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6. List the fields in /etc/ passwd file.
7. Procedure to add new user in Linux.
8. What is a file system ?
9. What is the difference between an Argument and an Option (or Switch) ?
10. What is the difference between Home Directory and Working Directory ?
11. What are two functions the move 'MV' Command can carry out ?

SECTION - C

Answer **any four** of the following questions :

(4×3=12)

12. Define a macro, a key binding for the existing command. How would you do it ?
13. What does the command 'hash' is used for in bash Shell ?
14. How will you abort a shell script before it is successfully executed ?
15. While installing the new RPM, what common steps should take ?
16. Usage of 'free' command in Linux.
17. Explain the usage of 'PS' Commands with example.

SECTION - D

Write an essay on **any two** of the following questions :

(2×5=10)

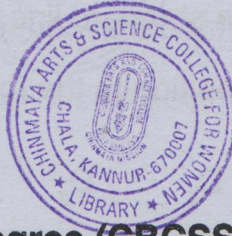
18. Advantage of shadow password over traditional password system.
 19. What is DHCP ? What are the advantages ?
 20. What is TELNET and how it works ?
 21. How do SSH keys work ?
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Reg. No. :

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IV Semester B.Sc. Degree (CBCSS – Reg./Supple./Imp.)
Examination, April 2020
(2014 Admn. Onwards)
COMPLEMENTARY COURSE IN MATHEMATICS
4C04 MAT – BCA : Mathematics for BCA – IV

Time : 3 Hours

Max. Marks : 40

SECTION – A

All the 4 questions are compulsory. They carry 1 mark each.

1. A random variable X has the density function $f(x) = \frac{c}{1+x^2}$ $-\infty < x < \infty$.
Find the value of the constant c .
2. What is an unbalanced transportation problem ?
3. Define interpolation.
4. Give Euler's iteration formula to solve the differential equation
 $y' = f(x, y)$ $y(x_0) = y_0$. (4×1=4)

SECTION – B

Answer any 7 questions from among the questions 5 to 13. These questions carry 2 marks each.

5. Find the expectation of the sum of points in tossing a pair of fair dice.
6. Prove that $\text{Var}(X + Y) = \text{Var}(X) + \text{Var}(Y)$.
7. A random variable X has density function given by $f(x) = \begin{cases} 2e^{-2x} & x \geq 0 \\ 0 & x < 0 \end{cases}$.
Use Chebyshev's inequality to obtain an upper bound on $P(|X - \mu| > 1)$.
8. Solve the following linear programming problem graphically,
Minimize $z = 4x_1 + 2x_2$ subject to the constraints $x_1 + 2x_2 \geq 2$, $3x_1 + x_2 \geq 3$,
 $4x_1 + 3x_2 \geq 6$, $x_1 \geq 0$, $x_2 \geq 0$.

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9. Explain the characteristics of a standard linear programming problem.
10. Find an initial basic feasible solution to the following transportation problem using Matrix minima method.

Market		D ₁	D ₂	D ₃	D ₄	Supply
	O ₁	1	2	3	4	6
Origin	O ₂	4	3	2	0	8
	O ₃	0	2	2	1	10
Demand		4	6	8	6	

11. Find a cubic polynomial which takes the following values
 $y(0) = 1$ $y(1) = 0$ $y(2) = 1$ $y(3) = 10$.
12. Using the data $\sin(0.1) = 0.09983$ and $\sin(0.2) = 0.19867$, find an approximate value of $\sin(0.15)$ by Lagrange interpolation.
13. Solve by Picard's method $y' = x + y^2$ subject to the condition $y = 1$ when $x = 0$. (7×2=14)

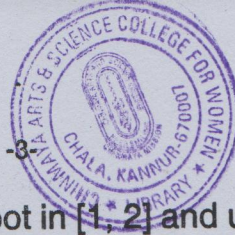
SECTION – C

Answer **any 4** questions from among the questions 14 to 19. These questions carry **3** marks each.

14. The joint density function of two continuous random variables X and Y is

$$f(x, y) = \begin{cases} cxy & 0 < x < 4; \quad 1 < y < 5 \\ 0 & \text{otherwise} \end{cases}$$
 Find the value of C and $P(1 < x < 2, 2 < y < 3)$.
15. A basic feasible solution to the following transportation problem is given as $x_{11} = 1$, $x_{12} = 10$, $x_{13} = 3$, $x_{23} = 12$ and $x_{31} = 5$. Is it an optimal solution, if not find an optimal solution.

Destination →		D ₁	D ₂	D ₃	Supply
	O ₁	6	8	4	14
Origin	O ₂	4	9	3	12
	O ₃	1	2	6	5
Demand		6	10	15	



16. Show that $f(x) = x^3 + 4x^2 - 10$ has a root in $[1, 2]$ and use the Bisection method to find a root, correct to three decimal places.
17. Form a table of difference for the function $f(x) = x^3 + 5x - 7$ $x = -1, 0, 1, 2, 3, 4, 5$. Obtain $f(6)$ from the table.
18. Evaluate $\int_1^3 \frac{1}{x} dx$ by Simpson's 1/3 rule with 4 steps.
19. Using Euler's method find $y(0.01)$ $y(0.03)$ given that $y' = -y$ $y(0) = 1$. (4×3=12)

SECTION - D

Answer any 2 questions from among the questions 20 to 23. These questions carry 5 marks each.

20. The probability function of a random variables X $f(x) = \begin{cases} x^2 / 81 & -3 < x < 6 \\ 0 & \text{otherwise} \end{cases}$
- Find the probability density function for (a) $U = X^2$ and (b) $U = \frac{1}{3}(12 - X)$.

21. Solve using simplex method
Maximize $z = x_1 + x_2$ subject to the constraints
 $2x_1 + x_2 \leq 4$ $x_1 + 2x_2 \leq 3$ $x_1 \geq 0$, $x_2 \geq 0$.
22. Given $\frac{dy}{dx} = 1 + y^2$ where $y = 0$ when $x = 0$. Find $y(0.2)$ and $y(0.4)$ using fourth order Runge Kutta method.
23. From the following table of values of x and y obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.2$.

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

(2×5=10)