K19U 0584

**IV Semester B.Sc. Degree (CBCSS – Reg./Supp./Imp.)
Examination, April 2019
(2014 Admission Onwards)
COMPLEMENTARY COURSE IN MATHEMATICS
4C04 MAT-BCA : Mathematics for BCA – IV**

Time : 3 Hours

Max. Marks : 40

Instruction : *Non programmable scientific calculator may be **used**.*

SECTION – A

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

1. If there are 6 red and 4 white balls and one ball is drawn at random. What is the probability of a red ball ?   **1**

2. When do you cail a solution to be degenerate solution ?   **1**

3. Write Lagrange's interpolation formula.   **1**

4. State Newton's forward difference interpolation formulae.   **1**

SECTION – B

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

5. Define a discrete random variable.   **2**

6. Find the probability function corresponding to the random variable X of tossing a coin twice.   **2**

P.T.O.

7. Find the feasible solution of the transportation problem using North West Corner method. **2**

	To			Supply
From	2	7	4	5
	3	3	1	8
	5	4	7	7
	1	6	2	14
Demand	7	9	18	

8. Define a feasible region in a graphical method. **2**

9. Find the value of $\sin \frac{\pi}{6}$, using Lagrange's interpolation formula. The function $y = \sin x$ is given below :

x	y = sin x
0	0
$\frac{\pi}{4}$	0.70711
$\frac{\pi}{2}$	1.0

2

10. Give the geometric significance of the trapezoidal rule. **2**

11. State the Lipschitz condition in Picards method. **2**

12. Solve the equation $y' = x + y^2$, subject to the condition $y = 1$ when $x = 0$. **2**

13. State Simpson's $\frac{1}{3}$ rule. **2**

SECTION – C

Answer **any 4** questions from among the questions **14** to **19**. **Each** question carries **3** marks.

14. Determine the probability of three 6's in five tosses of a fair die. **3**

15. A company has two grades of inspectors 1 and 2, the members of which are to be assigned for a quality control inspection. It is required that at least 2000 pieces be inspected per 8 hour day. Grade 1 inspector can check pieces at the rate of 40 per hour, with an accuracy of 97 percent. Grade 2 inspectors check at the rate of 30 pieces per hour with an accuracy of 95 percent. The wage rate of Grade 1 inspector is Rs. 5 per hour while that of a Grade 2 inspector is Rs. 4 per hour. An error made by an inspector costs Rs. 3/- to the company. There are only a Grade I inspectors and II Grade 2 inspectors available to the company. The company wishes to assign work to the available inspectors so as to minimize the total cost of the inspection. Formulate this as an LP model. 3

16. Find the initial basic feasible solution by VAM. 3

		Warehouse				
		W_1	W_2	W_3	W_4	Capacity
	F_1	21	16	25	13	11
Factory	F_2	17	18	14	23	13
	F_3	32	27	18	41	19
Requirements		6	10	12	15	43

17. Find the real root of the equation $x^3 - 2x - 5 = 0$. 3

18. Find the missing term in the following table : 3

x	y
0	1
1	3
2	9
3	–
4	81

19. Given the differential equation $\dfrac{dy}{dx} = \dfrac{x^2}{y^2 + 1}$ with initial condition y = 0 when x = 0. Use Picards method to obtain y for x = 0.25, 0.5 and 1.0 correct to three decimal places. 3

SECTION – D

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

20. Define variance. Find the variance and standard deviation of the random variable X given by $f(x) = \begin{cases} \frac{1}{2}x, & 0 < x < 2 \\ 0, & \text{otherwise} \end{cases}$.   **5**

21. Anita Electrical Company produces two Products P_1 and P_2. Products are produced and sold on a weekly basis. The weekly production cannot exceed 25 for Product P_1 and 35 for Product P_2. The company employs total of 60 workers Product P_1 requires 2 man-weeks of labour, which P_2 requires one man-week of labour. Profit margin of P_1 is Rs. 60 and on P_2 is Rs. 40. Formulate this problem as an LP problem and solve it graphically.   **5**

22. Calculate the first and second derivative of the function tabulated in the table below at the point x = 2.2 and also $\frac{dy}{dx}$ at x = 2.0.   **5**
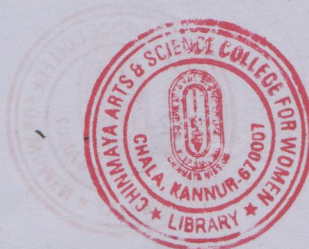
x	y
1.0	2.7183
1.2	3.3201
1.4	4.0552
1.6	4.9530
1.8	6.0496
2.0	7.3891
2.2	9.0250

23. Find a double root of the equation $f(x) = x^3 - x^2 - x + 1 = 0$.   **5**

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K19U 0621

IV Semester B.C.A. Degree (CBCSS – Reg./Supp./Imp.) Examination, April 2019
(2014 Admission Onwards)
General Course
4A14 BCA : NUMERICAL ANALYSIS

Time : 3 Hours

Max. Marks : 40

SECTION – A

1. **One** word answer. (8×.5=4)

    a) A matrix A is said to be invertible if and only if A is _____

    b) The errors introduced during the implementation of a numerical method are known as _____

    c) Decimal form of 2056_8 is _____

    d) The complement graph of a complete graph is _____

    e) A path in a graph G is called _____ path if it includes every edges exactly once.

    f) The omission of certain digits from a number results in _____ error.

    g) The method of obtaining the derivative of a function using a numerical technique is known as _____
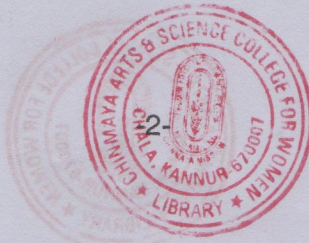
    h) Give an example of a linear function.

SECTION – B

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

2. Convert the hexadecimal number 12 AF to a decimal number.

3. Given the equation $\dfrac{dy}{dx} = 3x^2 + 1$, $y(1) = 2$, estimate y(2) by Euler's method using h = 0.5.

4. Use the trapezoidal rule with n = 4 to estimate $\displaystyle\int_1^2 \dfrac{1}{x}\,dx$.

5. Solve x – 2y = 3; 3x – 2y = 1 by Guass elimination method.

6. Define Graph and subgraph.

7. Define planar Graphs.

8. Estimate approximate derivative of $f(x) = x^3$ at x = 1, for h = 0.1 and h = 0.01.

9. Is the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 5 & 7 \end{bmatrix}$ invertible. Justify your answer.

10. Obtain an upper bound of error occured in calculating $\displaystyle\int_1^2 (x^3 + 1)\,dx$ by using trapezoidal rule.

11. Give examples for Algebraic, Polynomial and Transcendental equations.

SECTION – C

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

12. Use Taylor method to solve the equation $y' = x^2 + y^2$, y(0) = 1 for x = 0.25 and x = 0.5.

13. Explain the terms unique solution, no solution, non unique solution, Ill-conditioned system of the system AX = B, with examples.

14. Write an algorithm for the solution of non-linear equations by Bisection method.

15. Use simpson's rule with n = 4 to approximate $\displaystyle\int_0^1 5x^4\,dx$.

16. Obtain the solution of the following system using the Jacobi iteration method.

$2x + y + z = 5$, $3x + 5y + 2z = 15$, $2x + y + 4z = 8$.

17. The following table gives the values of distances travelled by a car at various time intervals.

t in seconds	5	6	7	8	9
s(t)	10	14.5	19.5	25.5	32

Estimate velocity and acceleration at t = 7.

SECTION – D

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

18. Using Runge-Kutta method to solve the equation $y' = 2xy + 1$, $y(0) = 0$, $h = 0.02$, for $x = 0.1$.
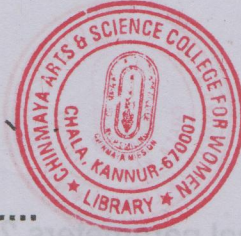
19. Derive Newton – Raphson formula using Taylor series expansion.

20. Compute the integral $I = \int_{-2}^{2} e^{-x/2}\, dx$ using Gaussian two-point formula.

21. Find the Lagrange interpolation polynomial to fit the following data.

i	0	1	2	3
xi	0	1	2	3
$e^{xi} - 1$	0	1.7183	6.3891	19.0855

Use the polynomial to estimate the value of $e^{1.5}$.

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Reg. No. : ....

Name : ....

IV Semester B.C.A. Degree (CBCSS – Reg./Supp./Imp.) Examination, April 2019
(2014 Admission Onwards)
Core Course
4B10BCA : LINUX ADMINISTRATION

Time : 3 Hours   Max. Marks : 40

SECTION – A

1. **One** word answer.   (8×0.5=4)

   a) _____ command gives you a long listing of files and directories in Linux.

   b) Applications communicate with Kernel by using _____

   c) The permission code that allows everyone to read or execute a file is _____

   d) The first process of Linux system is _____

   e) When you log into a Linux system you will be in _____ shell.

   f) _____ file provides system wide environment variables.

   g) GUI of Linux is termed as _____

   h) _____ symbol sends the output of a command to a file or a device.

SECTION – B

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

2. What is the use of umask command ?

3. What is system call ?

4. Write shell commands for the following :

   a) Create a directory EMPTY

   b) In this directory create a file called ADDRESS and store your name, age and address in it.

   c) Display the contents of ADDRESS on the screen.

   d) Make a copy of ADDRESS into another file NEWADDRESS.
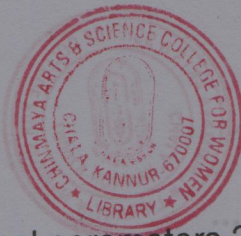
5. What do you mean by positional parameters ?

6. What is the use of cron command ?

7. Explain the significance of rc files.

8. What do you mean by tcp wrappers in Linux ?

9. How can you restrict access to Linux machine ?

10. Which command helps you to remove a file that has not been accessed for a period of time ? Explain with syntax.

11. What is the purpose of MBR partition ?

SECTION – C

(4×3=12)

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

12. Explain the different runlevels in Linux.

13. Describe grep command with syntax and example.

14. Write a shell script which displays the message "Good Morning"/"Good Afternoon"/"Good Evening" depending upon the time.

15. What are the usual permissions for a file ? How will you forcibly remove a file if you don't have write permission ?

16. What are the entries made in the inode table for each file ?

17. What is rpm ?

SECTION – D

(2×5=10)

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

18. Write a short note on GRUB.

19. Explain the decision making structures in Shell script with examples.

20. Explain the features of Linux.

21. Write a short note on Linux Package Management.
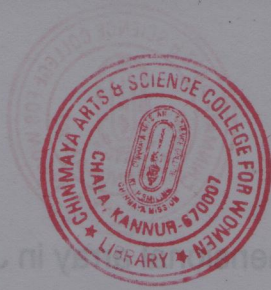
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Reg. No. : ....

Name : ....

IV Semester B.C.A. Degree (CBCSS-Reg./Supp./Imp.)
Examination, April 2019
(2014 Admission Onwards)
CORE COURSE
4B09BCA : Java Programming

Time : 3 Hours   Max. Marks : 40

SECTION – A

Answer **all** questions.

1. a) Expand the term AWT.

   b) The _____ method is used to get index of item selected in a list.

   c) _____ method writes data to a file.

   d) Super class of all classes in Java is _____

   e) _____ listener listens when a button is clicked.

   f) String method to concatenate two strings is _____

   g) The method used to retrieve exception message is _____

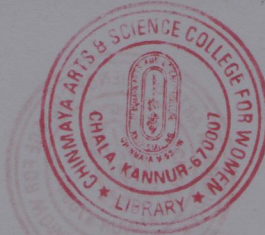   h) Java supports run time polymorphism. True/False.   **(8×0.5=4)**

SECTION – B

Answer **any 7** questions of the following. **Each** question carries **2** marks.

2. What is the use of JVM ?

3. Define abstraction.

4. Write hierarchy of exception classes ?

5. What are different bitwise operators in Java ?

6. What is an Applet ?

7. State method to retrieve data from TextField.

8. How to declare a one dimensional array in Java ?

9. What is the use of interface concept in Java ?

10. What do you mean by multithreading ?

11. Name various event classes. (7×2=14)

SECTION – C

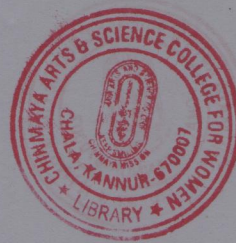Answer **any four** questions. **Each** question carries **3** marks.

12. Short note on history.

13. Write Java program to implement exception handling.

14. Explain packages in Java.

15. Write short note on thread life cycle.

16. Differentiate choice and list control.

17. Explain various datatypes in Java. (4×3=12)

SECTION – D

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

18. Explain use of super keyword in Java with examples.

19. Explain control statements in Java.

20. Explain menus and menu handling with a suitable example.

21. Explain various file streams in Java. (2×5=10)

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K19U 0622

IV Semester B.C.A. Degree (CBCSS - Reg./Supp./Imp.) Examination, April 2019
(2014 Admission Onwards)
Core Course
4B 08 BCA : OPERATING SYSTEM

Time : 3 Hours

Max. Marks : 40

SECTION – A

1. **One word** answer.

(8×0.5=4)

a) Interval between the time of submission and completion of a job is called

b) A scheduler which selects processes from a mass storage device is called

c) The OS of a computer serves as a software interface between the user and the

d) _____ algorithm is used to avoid deadlock in a system.

e) TLB stands for

f) _____ is the command used to make a directory.

g) In a disk, a track is further divided into

h) _____ occurs when a computer's virtual memory subsystem is in a constant state of paging.

SECTION – B

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

(7×2=14)

2. Write a note on swapping.

3. Define real time operating system.

4. Explain page fault.

5. What is latency time ?

P.T.O.

6. Define spooling.

7. What is memory compaction ?

8. Define threads.

9. Write the basic principle of SJF scheduling policy.

10. What is ASM ?

11. What is a deadlock ?

SECTION – C

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

12. What are the necessary conditions for a deadlock ?

13. What is demand paging ? Discuss the steps involved in handling a page fault.

14. With a neat diagram, explain the process life cycle.

15. List the components of a linux system.

16. Discuss any three general information models.

17. Discuss time sharing operating system.

SECTION – D

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

18. Discuss virtual memory.

19. Explain the various scheduling algorithms.

20. Explain I/O schedulers and I/O device handlers.

21. Discuss the following :

    a) Resource allocation graph

    b) Segmentation.

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