

**SECOND SEMESTER (CUCBCSS—UG) DEGREE RE-EXAMINATION
APRIL 2020**

B.C.A.

BCA 2C 04—OPERATIONS RESEARCH

(2017—2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

Section A

Answer all questions.

Each question carries 1 mark.

1. What is operation research ?
2. Write the models of LPP.
3. Define artificial variables.
4. What is degenerate and Non degenerate Basic feasible solution in LPP ?
5. State the limitations of OR.
6. State the transportation problem.
7. Define Travelling Salesman Problem.
8. What do you understand by graphical method ?
9. What is an unbounded solution ?
10. Define Critical Path method.

(10 × 1 = 10 marks)

Section B

Answer all questions.

Each question carries 2 marks.

11. Explain the standard form of a LPP.
12. Explain Duality.
13. Explain Transportation Table.

Turn over

14. Difference between CPM and PERT.
15. Define the terms Slack and surplus variables with examples each.
16. Explain the process of n jobs through 2 machines.
17. What is LPP ?
18. Explain Mathematical formulation of an Assignment Problem.

(8 × 2 = 16 marks)

Section C

*Answer any six questions.
Each question carries 4 marks.*

19. Solve the linear programming Problem :

$$\begin{aligned} \text{Maximize } Z &= 3x_1 + 2x_2 \\ \text{subject to } & -2x_1 + x_2 \leq 1, \\ & x_1 \leq 2, \\ & x_1 + x_2 \leq 3 \\ & x_1 \geq 0, x_2 \geq 0 \text{ graphically.} \end{aligned}$$

20. Explain the standard form of a LPP.
21. Find an initial basic feasible solution using least cost method.

	D	E	F	G	Availability
5	2	4	2	22	
From	4	8	1	6	15
	4	6	7	5	8
Demand	7	12	17	9	

22. Solve the Assignment Problem :

Salesman	I	II	III	IV
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

23. Explain Slack and float.
24. A company produces two types of hats. Each hat of the first type requires twice as much labour time as the second type. If all hats are of the second type only, the company can produce a total of 500 hats a day. The market limits daily sales of the first and second types to 150 and 250 hats. Assuming the profit per hat is Rs. 8 for type 1 and Rs. 5 for type 2, formulate the problem as a linear programming model in order to determine the number of hats to be produced of each type so as to maximise the profit.
25. Solve the LPP using Dual simplex method :

$$\begin{aligned} &\text{Minimize } Z = 3x_1 + x_2 \\ &\text{subject to } x_1 + x_2 \geq 1, 2x_1 + 3x_2 \geq 2, x_1, x_2 \geq 0. \end{aligned}$$

26. Explain VAM method.
27. Explain the difference between Transportation problem and Assignment problem.

(6 × 4 = 24 marks)

Section D

*Answer any three questions:
Each question carries 10 marks.*

28. Use Simplex method to solve the LPP :

$$\begin{aligned} &\text{Maximize } Z = 7x_1 + 5x_2 \\ &\text{subject to } x_1 + 2x_2 \leq 6 \\ &\quad 4x_1 + 3x_2 \leq 12, \\ &\quad x_1 \geq 0, x_2 \geq 0. \end{aligned}$$

29. Solve Transportation Problem :

	D	E	F	G	Available Unit
A	6	1	9	3	70
B	11	5	2	8	55
C	10	12	4	7	90
Requirement	85	35	50	4	

Turn over

30. Solve the travelling salesman problem for the following table :

From	To				
	T ₁	T ₂	T ₃	T ₄	T ₅
F ₁	∞	4	7	3	4
F ₂	4	∞	6	3	4
F ₃	7	6	∞	7	5
F ₄	3	3	7	∞	7
F ₅	4	4	5	7	∞

31. A Project schedule has the following characteristics :—

Activity	Time	Activity	Time
1-2	4	5-6	4
1-3	1	5-7	8
2-4	1	6-8	1
3-4	1	7-8	2
3-5	6	8-10	5
4-9	5	9-10	7

- Construct network diagram ;
- Find EST,LST,EFT, and LFT ; and
- Find critical path and project duration.

32. Ten jobs are required to be processed on two machines in the order, A B. Determine an optimal

Job	1	2	3	4	5	6	7	8	9	10
A	7	8	10	3	7	4	5	8	5	6
B	4	2	6	6	5	7	2	6	7	6

(3 × 10 = 30 marks)

**SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

B.C.A.

BCA 2C 04—OPERATIONS RESEARCH

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least eight questions.

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. Write any two applications of OR ?
2. What do you mean by an objective function of an LPP ?
3. What are the basic assumptions of a LPP ?
4. What do you mean by an artificial variable ?
5. What do you mean by basic feasible solution of a Transportation problem ?
6. What are Assignment problems ?
7. Define Travelling salesman problem.
8. What do you mean by Degeneracy in a TP ?
9. What is network analysis ?
10. What is meant by a Critical path ? Why should we know which activities are critical ?
11. What is dummy activity ?
12. Distinguish between 'Slack' and 'float'.

(8 × 3 = 24 marks)

Section B (Short Essay Type Questions)

Answer at least five questions.

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. What are the limitations of OR ?

Turn over

14. Solve Graphically :

$$\text{Maximizes} = 3x_1 + 5x_2$$

$$\text{subjected to } x_1 + 2x_2 \leq 2000 ;$$

$$x_1 + x_2 \leq 1500 ;$$

$$x_2 \leq 600 ;$$

$$x_1, x_2 \geq 0.$$

15. A manufacturer of furniture makes two products, chairs and tables. Processing of these products is done on two machines A and B. A chair requires 2 hours on machine A and 6 hours on machine B. A table requires 5 hours on machine A and no time on machine B. There are 16 hours of time per day available on machine A and 30 hours on machine B. Profit gained by the manufacturer from a chair is Re. 1 and from a table is Rs. 5 respectively. Formulate the problem into a LPP in order to maximise the total profit ?

16. Find the initial solution of the following TP by using Lowest cost entry method :

	D ₁	D ₂	D ₃	Supply
O ₁	2	7	4	5
O ₂	3	3	1	8
O ₃	5	4	7	7
O ₄	1	6	2	14
Demand	7	9	18	

17. Find the optimal solution to the following Assignment problem showing the cost for assigning workers to jobs :

	x	y	z
Workers	18	17	16
	15	13	14
	19	20	21

Draw a network diagram to the following set of activities

<i>Activities</i>	<i>Preceding activities</i>
A	-----
B	-----
C	A
D	A
E	B and C
F	B and C
G	B and C
H	D and E
I	F
J	F
K	G
L	H and I
M	H and I
N	J, K and L

Distinguish between PERT and CPM.

Section C

Answer any **one** question

The question carries 11 marks

Solve the following LPP by using Two-phase simplex method

$$\text{Maximize } Z = 5x_1 + 8x_2$$

$$\text{subjected to : } 3x_1 + 2x_2 \geq 3$$

$$x_1 + 4x_2 \geq 4$$

$$x_1 + x_2 \leq 5$$

$$x_1, x_2 > 0.$$

21. Solve the following minimal assignment problems :

	I	II	III	IV	V
A	1	3	2	3	6
B	2	4	3	1	5
C	5	6	3	4	6
D	3	1	4	2	2
E	1	5	6	5	4

(1 × 11 = 11 marks)

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SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION**APRIL 2021****B.C.A.****BCA 2C 03—FINANCIAL AND MANAGEMENT ACCOUNTING****Time : Two Hours****Maximum : 60 Marks****Section A (Short Answer Type Questions)***Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Define accounting Entity Concept.
2. Define Accounting.
3. Explain any *four* objectives of accounting.
4. What is Gross profit ?
5. What is imprest system ?
6. Define Marginal Costing.
7. What is cash budget ?
8. What is variance analysis ?
9. Define flexible Budget.
10. What is Comparative balance sheet ?
11. Name the sub-divisions of journal.
12. What is the purpose of preparing sales returns book ?

(8 × 3 = 24 marks)**Turn over**

Section B (Short Essay Type Questions)

Answer at least five questions.

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. Explain the limitations of accounting.
14. What are the needs of preparing Balance Sheet ?
15. Advantages of marginal costing.
16. Journalise the following transactions :

2019	January	1	Purchased furniture for cash Rs. 3,000
		3	Sold machinery for cash Rs. 6,000
		7	Purchased good for cash Rs. 4,200
		11	Sold goods for cash Rs. 4,500.
		15	Paid wages Rs. 300
		19	Paid to Kumar Rs. 500
		22	Received cash from Sonu Rs. 1,000
		28	Received commission Rs. 400
		31	Paid salary Rs. 1,000

17. Calculate Material Cost Variance, Material Quantity Variance and Material Price Variance from the following :

Material	Standard		Actual	
	Qty	Rate (Rs.)	Qty	Rate (Rs.)
X	1,000	6	1,100	7
Y	700	10	600	8

18. Prepare a Comparative Income statement of K Ltd. For the following Profit and Loss Account for the year ended 31st March 2016 and 2017 :

<i>Particulars</i>	2016	2017	<i>Particulars</i>	2016	2017
To Cost of goods sold	70,000	89,000	By Sales	1,00,000	1,20,000
To Operating expenses :—					
Administrative expenses	9,000	14,000			
Selling expenses	6,000	4,000			
To Net profit	15,000	13,000			
	1,00,000	1,20,000		1,00,000	1,20,000

19. The sale of a company for 2 different periods are 4,000 units and 7,000 units and the profits are Rs. 80,000 and Rs. 1,70,000. Calculate :

- Fixed cost.
- Break-even Point.
- Number of units to be sold to earn a profit of Rs. 2,00,000.

Assume selling price as to Rs. 100 per unit.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any one question.

The question carries 11 marks.

20. Calculate Material Cost Variance, Material Quantity Variance and Material Price Variance from the following :

Material	Standard		Actual	
	Qty	Rate (Rs.)	Qty	Rate (Rs.)
X	2,000	5	1,800	6
Y	1,000	8	1,100	7

Turn over

21. The expenses budgeted for production of 10,1000 units in a factory are furnished below :—

<i>Items</i>	<i>Cost per unit (Rs.)</i>
Materials	70
Labour	25
Variable factory overheads	20
Fixed Factory overhead (Rs. 1,00,000)	10
Variable expenses (Direct)	5
Selling expenses (10 % fixed)	13
Distribution expenses (20 % fixed)	7
Administrative expenses (Fixed Rs. 50,000)	5

You are required to prepare a Flexible Budget for the production of 6000 units.

(1 × 11 = 11 marks)

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SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2021

B.C.A.

BCA 2B 02—PROBLEM SOLVING USING C

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)*Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. What are identifiers ? How to declare variables ?
2. What is the use of symbolic constant ?
3. Which statement used for skipping of loop in C ?
4. Explain else-if ladder with suitable example.
5. Discuss the limitations of using getchar() & scanf() functions for reading strings ?
6. Write a program to enter check whether the given number is divisible by 8.
7. Explain formatted output statements in C
8. What is the difference between "=" and "==" ? Explain.
9. Differentiate array and structure.
10. Explain the use of formal arguments. Explain.
11. How to open a data file in C ?
12. What is the purpose of calloc() function ? Explain.

(8 × 3 = 24 marks)

Section B (Short Essay Type Questions)*Answer at least five questions.**Each question carries 5 marks.**All questions can be attended.**Overall Ceiling 25.*

13. Explain the different types of Tokens in C with relevant program examples.
14. Arithmetic expressions, precedence of arithmetic operators and Type conversion in Expressions. Explain each with examples.

Turn over

15. When and why we use looping statements in C ? Write a program to find the average of positive numbers from a list of numbers using loop and continue statement.
16. What is a NULL character ? Why is it important ? Explain any three string handling functions in detail.
17. Write a program to find second largest and smallest element from a list of numbers without use an array.
18. Is it possible to pass structure variable to function ? Explain how to pass structure members as an argument ? With examples.
19. Write a C program to swap two numbers using call by value method.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

*Answer any one question.
The question carries 11 marks.*

20.
 - a) Explain different input and output statements used in C.
 - b) What is the difference between call by value and call by reference ? Explain with the help of an example.
21.
 - a) Write a C program to multiply two matrices, use user defined functions and pass parameters.
 - b) What do you mean by scope of a variable ? What are local and global variables ? Give examples.

(1 × 11 = 11 marks)

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION**APRIL 2021****B.C.A.****BCA 2C 04—OPERATION RESEARCH****(2017 Admissions)**

Time : Three Hours

Maximum : 80 Marks

Section A

*Answer all questions.
Each question carries 1 mark.*

1. Define feasible solution in LPP.
2. Define artificial variable.
3. What you mean by basis and basic variable ?
4. Write any *two* characteristics of dual problems.
5. What you mean by Project crashing ?
6. Cites any *two* areas where assignment technique is applied.
7. What are transportation problems ?
8. Define total elapsed time.
9. What you mean by dummy activity ?
10. Define Critical Path.

(10 × 1 = 10 marks)**Section B**

*Answer all questions.
Each question carries 2 marks.*

11. Write any difference between PERT and CPM.
12. Write any *four* assumptions of Sequencing Problem.
13. What are the limitations of Operation Research ?

Turn over

14. How will you solve maximization problem using assignment technique ?
15. When is the solution to a LPP infeasible ?
16. Define Slack of an event and Slack of an activity.
17. How to find the dual of a given primal ?
18. What do you understand by degeneracy in transportation problem ?

(8 × 2 = 16 marks)

Section C

Answer any six questions.

Each question carries 4 marks.

19. Write a note path Critical path analysis.
20. Describe the procedure for solving two jobs through machine.
21. Show that assignment problems are particular cases of transportation problem ?
22. Briefly explain PERT/ CPM network component.
23. Define Operation research and explain its application.
24. Write the uses of Linear Programming Problem.
25. How to construct a simplex table ?
26. What is sensitivity analysis ?
27. What are the characteristic of Linear Programming Problem ?

(6 × 4 = 24 marks)

Section D

Answer any three questions.

Each question carries 10 marks.

28. Solve the LPP using Big M method :

$$\text{Minimize } Z = 9x_1 + 10x_2$$

$$\text{subject to } x_1 + 2x_2 \geq 50$$

$$4x_1 + 3x_2 \geq 24$$

$$3x_1 + 2x_2 \geq 60$$

$$x_1, x_2 \geq 0.$$

29. There are seven jobs, each of which has to go through the machine A and B in the order AB. Processing times in hours are as follow :

Job	1	2	3	4	5	6	7
Machine A	3	12	15	6	10	11	9
Machine B	8	10	10	6	12	1	3

30. A salesman has to visit 5 cities A, B, C, D, E. The distances between the five cities are given in the table below. If the salesman starts from the city A and has to come back to city A, which route should be select so that total distance travelled by him is minimized :

	A	B	C	D	E
A	—	4	7	3	4
B	4	—	6	3	4
C	7	6	—	7	5
D	3	3	7	—	7
E	4	4	5	7	—

31. Solve the LPP using Simplex method :

$$\text{Maximize } Z = X_1 + 5X_2 + 4X_3$$

$$\text{subject to } 2X_1 + 3X_2 \leq 8$$

$$2X_2 + 5X_3 \leq 10$$

$$3X_1 + 2X_2 + 4X_3 \leq 15$$

$$X_1, X_2, X_3 \geq 0.$$

32. Solve the following Transportation Problem :

	I	II	III	Supply
A	2	7	4	5
B	3	3	1	8
C	5	4	7	7
D	1	6	2	14
Demand	7	9	18	

(3 × 10 = 30 marks)

**SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

B.C.A.

BCA 2C 04—NUMERICAL METHODS IN C

(2014 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A (Objective Type Questions)

Answer all questions (1–10).

Each question carries 1 mark.

1. What is meant by truncation error n numerical methods ?
2. What do you mean by significant digits ?
3. The error order in Trapezoidal rule is _____.
4. When we say a system $Ax = b$ of linear equations is consistent.
5. Give any *one* merit and demerit of bisection method.
6. Fill in the blanks : Method of false position (Regula Falsi method) is also known as _____.
7. When does the Simpsons 1/3 rule for integrating $\int_a^b f(x) dx$ gives exact results ?
8. Write the general formula in Euler's method.
9. Choose the correct answer : Taylor series method is an _____ method.
 - a) Explicit single step ; b) Explicit multi-step ; c) Implicit single step ; and d) Implicit multi-step.
10. Write the formula for Newton-Raphson method.

(10 × 1 = 10 marks)

Turn over

Part B (Short Answer Type)

Answer all questions (11 - 15).

Each question carries 2 marks.

11. Define the order (rate) of convergence of an iterative method for finding the root of an equation $f(x) = 0$.
12. Describe the principle involved in the Gauss elimination method.
13. For performing interpolation for a given data, when do we use the Newtons forward and backward difference formulas ?
14. Write down the formulas employed in Romberg integration.
15. Write an example for single step and multi-step methods for numerical solution of differential equations.

(5 × 2 = 10 marks)

Part C (Short Essay Type)

Answer any five questions (16 - 23).

Each question carries 4 marks.

16. Find intervals of length 1 with integer end points which contain real roots of the following equations :
 - (i) $8x^3 - 12x^2 - 2x + 3 = 0$; and (ii) $3x^3 - 2x^2 - x - 5 = 0$.
17. Given that the equation $x^{2.2} = 69$ has a root between 5 and 8. Use the method of Regula-Falsi to determine it.
18. Test the consistency and if yes solve the following system of equations :

$$x_1 + 10x_2 - x_3 = 3$$

$$2x_1 + 3x_2 + 20x_3 = 7$$

$$9x_1 + 22x_2 + 79x_3 = 45$$

using the Gauss elimination method.

19. The following data gives the velocity of a particle for 8 seconds at an interval of 2 seconds. Find the initial acceleration using the entire data :

t (sec)	0	2	4	6	8
v (m/sec)	0	172	1304	4356	10288

20. Using Trapezoidal rule evaluate $\int_0^1 \frac{dx}{x^2 + 6x + 10}$, with 4 sub-intervals.
21. Evaluate $\int_0^6 \frac{dx}{x^2 + 3}$ using Simpson's three-eight rule.
22. Given $y' = 1 + y^2$, $y(0) = 0$. Using fourth order Runge-Kutta formula, find $y(0.2)$.
23. Consider the initial value problem $y' = x(y + 1)$, $y(0) = 1$. Compute $y(0.2)$ with $h = 0.1$ using Euler method.

(5 × 4 = 20 marks)

Part D (Essay Questions)

Answer any five questions (24 - 31).

Each question carries 8 marks.

24. Using bisection method find a root of the equation $f(x) = e^{-x}(3.2 \sin x - 0.5 \cos x)$ in the interval $[3, 4]$, correct to 3 decimal places.
25. Solve the following system of linear equations by Gauss elimination method :
- $$2x_1 + x_2 + 2x_3 + x_4 = 6$$
- $$6x_1 - 6x_2 + 6x_3 + 12x_4 = 36$$
- $$4x_1 + 3x_2 + 3x_3 - 3x_4 = -1$$
- $$2x_1 - 1 + 2x_2 - x_3 + x_4 = 10.$$
26. Solve the following system of equations by Cramer's Rule.
- $$y - 2z = 8; x + 3z = 2; 7x + y + z = 0.$$

Turn over

27. Using Newton's forward difference formula, find the sum $S_n = 1^3 + 2^3 + 3^3 + \dots + n^3$.
28. Derive Lagrange's interpolation formula for arbitrarily spaced x values.
29. a) Evaluate $\int_0^1 \frac{dx}{1+x}$ by Trapezoidal rule with $h = 0.25$.
- b) Use Euler's modified method to find $y(0.2)$. Given $y' = 1 + \log(x + y)$, $y(0) = 1$.
30. Using Romberg integration, obtain a sixth-order accurate approximation to $\int_0^1 e^{-x^2} dx$.
31. Using Taylor series method, solve $5xy' + y^2 - 2 = 0$, $y(4) = 1$. Also, find $y(4.1)$.

(5 × 8 = 40 marks)

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

B.C.A.

BCA 2C 03—FINANCIAL AND MANAGEMENT ACCOUNTING

(2017 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A*Answer all the questions.**Each question carries 1 mark.*

1. State any two examples of Nominal account.
2. Explain matching principle.
3. What do you mean by contra entry ?
4. What is journal proper ?
5. What is FF5 ?
6. Explain contribution.
7. What is PV ratio ?
8. Explain margin of safety.
9. What is Marginal cost ?
10. What is Master budget ?

(10 × 1 = 10 marks)

Part B*Answer all the questions.**Each question carries 2 marks.*

11. What are functional budget ?
12. Explain compensating errors.
13. What is mean by overhead ?
14. Briefly explain Break even chart.
15. Explain common size statement.

Turn over

16. Journalise the following transactions :
- A) Purchased goods from Joe.
B) Received commission.
17. Calculate Contribution from the following information
Sales Rs. 8,00,000. Variable cost Rs. 4,00,000.
18. From the following compute Gross profit.

	Rs.
Opening stock	14,000
Purchase	36,000
Sales	92,000
Carriage inwards	2,500
Closing stock	15,000

(8 × 2 = 16 marks)

Part C

*Answer any six questions.
Each question carries 4 marks.*

19. Briefly explain objectives of budget.
20. What are the advantages of budgetary control?
21. Explain merits and demerits of marginal costing.
22. Mention difference between Trial balance and Balance Sheet.
23. Write down the assumptions of Break even Analysis.
24. Record the following transaction in the purchase journal of Saaj Agencies

2022 January

- 1 Purchased from Sreeram Electricals :

10 Philips Tube lights @ Rs. 100

10 khaitan Ceiling Fans @ Rs. 800

- 4 Purchased from Ismail & Sons :

20 Immersion Heaters @ Rs. 21

5 Electric Irons @ Rs. 240

- 15 Purchased from Quilon Radio Services :

10 Table Fans @ Rs. 1,200

20 Electric Kettles @ Rs. 90

21 Purchased from Bajaj Agency :

50 Tube Lights @ Rs. 140

Less trade discount @5%

25. A manufacturing company submits the following figures of product X for the first quarter of 2019
Sales (in units)

January 50,000

February 40,000

March 60,000

Selling price per unit 100

Target of 1st Quarter 2020 :

Sales quantity increase 20%

Sales price increase 10%

Prepare Sales Budget for the first quarter of 2020.

26. Show the following in a Common size income statement :

Sales	27,00,000
Cost of sales	10,00,000
Gross profit	17,00,000
Operating expenses	8,00,000
Non operating expenses	50,000
Non operating income	40,000
Net profit	8,90,000

27. Prepare Trial Balance from the following

Cash in Hand	1,700	
Cash at Bank	2,620	
Capital	5,000	
Drawings	600	
Furniture	1,700	
Bills Receivable	1,500	
Bills Payable	1,500	

Turn over

Purchases		4,200
Sales	5,250	
Purchase return	125	
Sales return		225
Stationery		50
Rent	150	
Salaries	400	
Discount Allowed		30
Discount Received		25
Sundry Debtors	575	
Sundry Creditors		1,850

(6 × 4 = 24 marks)

Part D

Answer any **three** questions.
Each question carries 10 marks.

28. What are subsidiary journal ? Explain different features of journals.
29. The following are the balance sheet of Kay Cey Ltd. for the year 2009 and 2010. Prepare comparative Balance Sheet and study the financial position :

Liabilities	2020	2021	Assets	2020	2021
E. Share Capital	5,45,00	7,95,00	Land &	3,70,00	5,70,00
Reserves	0	0	Building	0	0
Retained	2,00,00	2,25,00	Plant &	4,00,00	6,00,00
Earnings	0	0	Machinery	0	0
Debentures	1,50,00	2,50,00	Furniture	50,000	75,000
Bills Payable	0	0	Stock	2,00,00	2,25,00
Sundry	2,50,00	3,50,00	Sundry	0	0
Creditors	0	0	Debtors	1,50,00	1,75,00
Other Current	75,000	90,000	Bills	0	0
Liabilities	2,00,00	2,25,00	Receivable	1,00,00	90,000
	0	0	Cash	0	3,00,00
	50,000	1,00,00		2,00,00	0
		0		0	
Total	14,70,000	20,35,000	Total	14,70,000	20,35,000

30. Trial Balance of Lakshmi Stores show the following balance on 31-12-2012 :

<i>Particulars</i>	<i>Debit</i>	<i>Credit</i>
Capital	-	58,400
Opening stock	15,000	-
Purchases	60,000	-
Sales	-	1,10,000
Purchase return	-	3,500
Sales return	2,200	-
Advertisement	3,000	-
Freight	3,800	-
Bank charge	1,000	-
Discount allowed	1,200	-
Discount received	-	1,800
Machinery	20,000	-
Sundry debtors	30,000	-
Sundry creditors	-	18,000
Drawings	8,000	-
Cash in hand	1,200	-
Cash at bank	2,500	-
Manufacturing expenses	3,800	-
Land and Building	40,000	-
	1,91,700	1,91,700

The closing stock is valued at Rs. 19,500. Prepare Trading and Profit and Loss Account for the year ending 31-12-2012 and Balance Sheet as on that date.

31. A Company is expecting to have Rs. 25,000 in hand on April 1, 2021 and it requires you to prepare a cash budget for three months April to June 2021. The following data is given :

Month	Sales in Rs.	Purchase in Rs.	Wages in Rs.	Expense in Rs.
February	70,000	40,000	8,000	6,000
March	80,000	50,000	8,000	7,000
April	92,000	77,000	9,000	7,000
May	1,00,000	60,000	10,000	8,000
June	1,20,000	55,000	12,000	9,000

Turn over

Other information :

1. Period of credit allowed by Suppliers - 2 months.
2. 25% of the sales are for cash and period of credit allowed to customers for credit sales is one month.
3. Delay in payment of wages and expenses - 1 month.
4. Income tax of Rs. 25,000 is to be paid in June 2021.

32. Calculate :

1. Contribution per unit.
2. B.E.P (in units).
3. P/V Ratio.
4. Break- Even sale.
5. Margin of safety.
6. Sales to earn a profit of Rs. 80,000.
7. Profit at a sale of Rs. 5,00,000.

Total units and produced and sold	10,000
Selling Price per Unit	Rs. 20
Variable cost per unit	Rs. 12
Fixed cost for the period	Rs. 40,000.

(3 × 10 = 30 marks)

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

B.C.A.

BCA 2C 03—COMPUTER ORIENTED STATISTICAL METHODS

(2014 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A*Answer all questions.**Each question carries 1 mark.*

1. The standard deviation of set observations is 2. If all the observations are multiplied by 5 the new standard deviation will be _____.
2. The geometric mean of regression co-efficients is _____.
3. If A and B are two disjoint events, $P(A \cap B) =$ _____.
4. Let $P(A) = 1$. Then the event A is known as _____.
5. For a _____ distribution the mean and variance are equal.
6. Let $M_X(t)$ be the mgf of a random variable X. Then $M_X(0) =$ _____.
7. _____ is the standard error of sample mean.
8. The variance of Chi-square distribution with 5 degrees of freedom is _____.
9. If T_n is an estimator such that T_n converges in probability to θ , then T_n is said to be a _____ estimator.
10. Accepting a null hypothesis when it is false is known as _____.

(10 × 1 = 10 marks)

Part B (Short Answer Type Questions)*Answer all questions.**Each question carries 2 marks.*

11. The mean marks obtained by 50 students were found to be 60. If at time of calculation one observation was wrongly taken as 15 instead of 50, obtain the corrected mean. .
12. Let A and B are two events in the sample space such that $P(A) = 0.40$, $P(B) = p$ and $P(A \cap B) = 0.70$. Find the value of p if the events are disjoint.

Turn over

13. The distribution function of a random variable X is given in the following table. Find the probability distribution of X .

x	-2	-1	0	1	2
$F(x)$	$\frac{1}{5}$	$\frac{3}{5}$	$\frac{4}{5}$	$\frac{9}{10}$	1

14. Write down the p.d.f. of F distribution.
 15. State Neyman-Pearson lemma.

(5 × 2 = 10 marks)

Part C (Short Essay Type Questions)

*Answer any five questions.
 Each question carries 4 marks.*

16. Find the missing frequencies from the following data :

No. of accidents	0	1	2	3	4	5	Total
Frequency	46	--	--	25	10	5	200

The average number of accidents is given by 1.46.

17. By using an example show that the correlation coefficient is zero does not imply that the variables are independent.
18. Two unbiased dice are thrown. Define the random variable X as maximum number shown up. Find the expected value of X .
19. Obtain the mgf of a random variable with p.d.f. $f(x) = pq^x$, $x = 0, 1, 2 \dots$ and $p + q = 1$.
20. Express central moments in terms of raw moments.
21. Show that, for a Poisson population sample mean is an unbiased estimator of population mean.
22. Give an example to show that consistent estimator need not be unbiased.
23. In a random sample of 120 workers of a factory 40 are dissatisfied with their working condition. Obtain a 95% confidence interval for the proportion of dissatisfied workers of the factory.

(5 × 4 = 20 marks)

Part D (Essay Questions)

*Answer any five questions.
Each question carries 8 marks.*

24. In an analysis of monthly wages paid to the workers in two firms A and B belonging to the same industry gave the following result :

	Firm A	Firm B
No. of wage earners	986	548
Average hourly wages	Rs. 52.5	Rs. 47.5
Variance of dis. Of wages	100	121

- (a) Which firm A or B pays out larger amount as hourly wages ?
 (b) In which firm A or B there is greater variability in individual wages ?
 (c) What are the measures of average hourly wages and variability in individual wages if all the workers in firm A and B taken together ?
25. The following data gives income in rupees of individuals in two cities. Draw Lorenz curves and comment on the distribution income of both the cities :

Income	0-1000	1000-5000	5000-20000	20000-50000	50000-1 laks
City A	22	78	124	24	9
City B	25	98	116	20	15

26. Derive the formula for Spearman's rank correlation co-efficient.
27. Let $N = 100$, $\sum X_i = 5000$, $\sum Y_i = 10000$, $\sum X_i^2 = 260000$, $\sum Y_i^2 = 1040000$ and $\sum X_i Y_i = 516000$
- (a) Find the predicted value of X, when $Y = 80$.
 (b) What is the predicted value of Y, when $X = 60$?
 (c) Find the correlation coefficient between X and Y.
28. Two unbiased dice are thrown. Find the probability that :
- (a) Both the dice shows the same number.
 (b) The first die shows 6.
 (c) Total of the numbers on the dice is 13.
 (d) Total of the numbers on the dice any number from 2 to 12 both inclusive.

Turn over

29. The joint p.d.f. of (X, Y) is given by

$$f(x, y) = \begin{cases} k\left(x^2 + \frac{xy}{3}\right), & 0 \leq x \leq 1; 0 \leq y \leq 2 \\ 0, & \text{otherwise} \end{cases}$$

Examine whether X and Y are independent.

30. Obtain the MLE of α and β using a random sample of size n taken from the population with p.d.f.

$$f(x) = \frac{1}{\beta} e^{-\frac{(x-\alpha)}{\beta}}, x \geq \alpha, \beta \geq 0$$

31. Construct a 95% confidence interval for variance σ^2 of the Normal population using the following sample :

4.5, 10.2, 10.5, 9.8, 13.0, 19.2, 15.5, 13.3, 10.8 and 16.4. Assuming that population mean is unknown.

(5 × 8 = 40 marks)

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

B.C.A.

BCA 2B 02—PROBLEM SOLVING USING C

(2017 Admissions)

Time : Three Hours

Maximum : 80 Marks

Section A

*Answer all questions.
Each question carries 1 mark.*

1. What is C Tokens ?
2. What is a variable ?
3. What is the use of *goto* statement ?
4. Write the use of *switch* statement with an example
5. What is nesting of loops ?
6. What is *break* statement ?
7. Write the importance of library functions.
8. What is a two-dimensional array ?
9. What is recursion ?
10. What is the use of pointers ?

(10 × 1 = 10 marks)

Section B

*Answer all questions.
Each question carries 2 marks.*

11. Write the syntax of variable declaration with an example.
12. What are increment and decrement operator ?
13. Write the use of *while* statement with syntax and example.
14. What is a library function ? Give two examples.
15. What is nested if statements in C ? Explain with an example.
16. What do you mean by formatted input ? Give an example.

Turn over

17. Explain actual and formal arguments of functions.
18. Write the process of creating a file in C program.

(8 × 2 = 16 marks)

Section C

*Answer any six questions.
Each question carries 4 marks.*

19. Write the steps for writing, saving and compiling a C program.
20. Write the precedence of different operators.
21. Differentiate between logical and relational operators.
22. Write the use of for loop with syntax and example.
23. Write about the input and output functions used in C program.
24. Write a C program to find the sum of digits of a number.
25. Explain different methods for passing parameters to functions in C.
26. Explain about structure and union with example.
27. Illustrate the use of pointers in arrays with a C program.

(6 × 4 = 24 marks)

Section D

*Answer any three questions.
Each question carries 10 marks.*

28. Write a note on primitive data types in C with example.
29. Explain about the various control statement used in C with syntax and example.
30. Explain the different storage classes in C.
31. Write a C program to multiply the elements of two matrices.
32. Explain with examples the different string handling functions used in C.

(3 × 10 = 30 marks)

**SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

B.C.A.

BCA 2B 02—OBJECT ORIENTED PROGRAMMING WITH C++

(2014 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

Answer all questions.

Each question carries 1 mark.

1. _____ is the process by which objects of one class acquire the properties of objects of another class.
2. The smallest individual units in a program are known as _____.
3. For _____ function the compiler replaces the function call with the corresponding function code.
4. The _____ operator is used to define a member function outside the class definition.
5. The member functions which has the same name as that of the class in which it is defined and used to initialize objects of its own are known as _____.
6. The mechanism of giving special meaning to an operator is known as _____.
7. _____ arguments are required in binary operator overloading using member function.
8. When the properties of one class is inherited by more than one class it is called.....inheritance.
9. A _____ class is one that is not used to create an object.
10. _____ is a unique pointer that is automatically passed to a member function when it is called.

(10 × 1 = 10 marks)

Turn over

Part B

*Answer all questions.
Each question carries 2 marks.*

11. What is a reference variable ? How is it created ?
12. Explain the **endl** and **setw** manipulators.
13. What is friend function ?
14. What is function overloading ? Write the syntax for overloaded functions.
15. What is virtual base class ?

(5 × 2 = 10 marks)

Part C

*Answer any five questions.
Each question carries 4 marks.*

16. How does a class enforce data-hiding, abstraction and encapsulation ?
17. Describe with example the uses of enumerated data types.
18. Explain with examples how functions are defined inside and outside the class definition.
19. Write an example CPP program to illustrate the concept of array of objects.
20. What is a constructor. Explain different types of constructors.
21. Explain the difference between operator overloading using member function and friend function.
22. Explain various types of inheritance.
23. Write notes on : (i) File modes ; and (ii) File pointers and their manipulators.

(5 × 4 = 20 marks)

Part D

*Answer any five questions.
Each question carries 8 marks.*

24. Explain basic principles of object orientation.
25. Explain : (i) Default arguments ; (ii) Nesting of member functions and (iii) Visibility modes.

26. Write a CPP program to add two complex numbers using the concept of object as function arguments.
27. What is operator overloading ? Write a CPP program to overload the binary '+' operator to add two complex numbers.
28. Create a class student to store roll number, class and name of the student. From this derive two classes Internal and External to store the internal and external marks of 5 subjects. Another class Result is derived from the classes Internal and External to calculate the total and display the grade .Using the concept of array of objects display the grade card for the students of your class.
29. Write notes on compile time polymorphism and run time polymorphism. Explain how virtual functions are used to achieve run time polymorphism with a suitable CPP program.
30. Explain formatted and unformatted Console I/O operations : (i) Explain get(), getline(), put() and write() functions and (ii) Explain formatting console I/O by ios class functions and manipulators.
31. Write notes on : (i) Command line arguments ; and (ii) Class templates and function templates.

(5 × 8 = 40 marks)