

UG-CS-1170

BMSSA-22

**U.G. DEGREE EXAMINATION –
FEBRUARY 2023.**

Computer Science

Third Semester

Allied – MATHEMATICS – 2

Time : 3 hours

Maximum marks : 70

SECTION A — (3 × 3 = 9 marks)

Answer any **THREE** questions.

1. Define Gamma function.

2. Evaluate $I = \int_0^1 \frac{1}{1+x} dx$ by Trapezoidal rule using

the table and correct to three decimal place.

x	0	0.5	1.0
y	1.000	0.666	0.5000

3. Evaluate $\int_0^1 \int_0^2 (x^2 + y^2) dy dx$.

4. Evaluate $L[t]$.
5. Define Rank Correlation.

SECTION B — ($3 \times 7 = 21$ marks)

Answer any THREE questions.

6. Prove that $\Gamma \frac{1}{2} = \sqrt{\pi}$.
7. The following table gives the corresponding values of x and y . Prepare a forward difference table and express y as a function of x . Also obtain y when $x = 2.5$.

$x:$	0	1	2	3	4
$y:$	7	10	13	22	43

8. Evaluate $\int_1^3 \int_2^3 \int_1^2 (x - y + z) dx dy dz$.

9. Find $L^{-1} \left[\frac{1}{s(s+1)(s+2)} \right]$.

10. Compute coefficient of correlation for the following:

$x:$	25	35	45	52	20	33	40	30
$y:$	20	15	10	14	23	18	22	30

SECTION C — (4 × 10 = 40 marks)

Answer any FOUR questions.

11. Prove that $\beta(m, n) = \frac{\Gamma m \Gamma n}{\Gamma m + n}$.

12. Using Newton's Backward formula find the annual premium at the age of 33 from the data:

Age in years : 24 28 32 36 40

Annual premium : 28.06 30.19 32.75 34.94 40

13. Evaluate the following integral by change the order of integration.

$$\int_0^{\infty} \left[\int_x^{\infty} \frac{e^{-y}}{y} dy \right] dx.$$

14. Solve the differential equation using Laplace

transform $\frac{d^2 y}{dt^2} - \frac{dy}{dt} - 2y = 0$ given $y(0) = -2$
 $y'(0) = 5$.

15. Calculate the rank Correlation Coefficient from the following data :

x : 52 63 45 36 72 65 47 25

y : 62 53 51 25 79 43 60 33

16. From the following table using Simpson's $\left(\frac{1}{3}\right)^{\text{rd}}$

rule $\int_{7.47}^{7.52} y(x)dx$, $h = 0.01$. Evaluate

x : 7.47 7.48 7.49 7.50 7.51 7.52

y : 1.93 1.95 1.98 2.01 2.03 2.06

17. Calculate Karl Pearson's coefficient from the following:

x : 32 35 27 28 25 40

y : 28 32 26 35 24 38

U.G. DEGREE EXAMINATION –
FEBRUARY, 2023.

Computer Science/Computer Applications

Third Semester

ALLIED MATHEMATICS – II

Time : 3 hours

Maximum marks : 70

PART A — (3 × 3 = 9 marks)

Answer any THREE questions.

1. Define Gamma function.
2. Evaluate $I = \int_0^1 \frac{1}{1+x} dx$ by Trapezoidal rule using the Table and correct to three decimal place

x	0	0.5	1.0
y	1.000	0.666	0.5000

3. Evaluate $\int_0^1 \int_0^2 (x^2 + y^2) dy dx$.

4. Evaluate $L[t]$.

5. Define Rank correlation.

PART B — ($3 \times 7 = 21$ marks)

Answer any THREE questions.

6. Prove that $\sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}}$.

7. The following table gives the corresponding values of x and y . Prepare a forward difference table and express y as a function of x . Also obtain y when $x = 2.5$.

x	0	1	2	3	4
y	7	10	13	22	43

8. Evaluate $\int_1^3 \int_2^3 \int_1^2 (x - y + z) dx dy dz$.

9. Find $L^{-1}\left[\frac{1}{s(s+1)(s+2)}\right]$.

10. Compute coefficient of correlation for the following data :

x	25	35	45	52	20	33	40	30
y	20	15	10	14	23	18	22	30

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions.

11. Prove that $\beta(m, n) = \frac{\overline{m} \overline{n}}{\overline{(m+n)}}$.

12. Using Newton's Backward formula find the annual premium at the age of 33 from the data

Age (in years)	24	28	32	36	40
Annual premium	28.06	30.19	32.75	34.94	40

13. Evaluate the following integral by change the order of integration

$$\int_0^{\infty} \left[\int_x^{\infty} \frac{e^{-y}}{y} dy \right] dx.$$

14. Solve the differential equations using Laplace transform

$$\frac{d^2y}{dt^2} - \frac{dy}{dt} - 2y = 0 \text{ given } y(0) = -2, y'(0) = 5$$

15. Calculate the rank correlation coefficient from the following data

x	52	63	45	36	72	65	47	25
y	62	53	51	25	79	43	60	33

16. From the following table using Simpson's $\left(\frac{1}{3}\right)^{\text{rd}}$

rule $h = 0.01$. Evaluate :

x	7.47	7.48	7.49	7.50	7.51	7.52
y	1.93	1.95	1.98	2.01	2.03	2.06

17. Calculate Karl Pearson's coefficient from the following data

x	32	35	27	28	25	40
y	28	32	26	35	24	38

UG-CS-1206

BSCSS-31/

BCAS-31/

BCASX-31

**U.G. DEGREE EXAMINATION —
FEBRUARY, 2023.**

Computer Applications

Third Semester

PROGRAMMING USING C++

Time : 3 hours

Maximum marks : 70

PART A — (3 × 3 = 9 marks)

**Answer any THREE questions out of Five questions
in 100 words.**

All questions carry equal marks.

1. Define the term Encapsulation.
2. What is a Constant? Give example.
3. Define Manipulator.
4. Write about operator overloading and give example.
5. What is an inheritance?

PART B — (3 × 7 = 21 marks)

Answer any THREE questions out of Five questions
in 200 words.

All questions carry equal marks.

6. Describe the Basic Data Types with example.
7. Discuss about Scope Resolution Operator with example.
8. Briefly explain Return by Reference.
9. Write about multiple constructors in a class.
10. Write a note on Pointers with necessary example.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions out of Seven questions
in 500 words.

All questions carry equal marks.

11. Discuss in detail about basic concepts of OOP.
12. Explicate in detail about Operators.
13. Explain In line Functions with example.
14. Illustrate the Static Data Members.

15. Describe Inheritance in detail.
 16. Explain Pointers in detail with necessary example.
 17. Write a C++ Program to find the palindrome of a number.
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UG–CS–1207

**BSCSS-32/
BCAS-32/
BCASX-32**

**U.G. DEGREE EXAMINATION,
FEBRUARY 2023**

Computer Science

Third Semester

DATA STRUCTURES

Time : 3 hours

Maximum marks : 70

PART A — (3 × 3 = 9 marks)

**Answer any THREE questions out of FIVE questions
in 100 words.**

All questions carry equal marks.

1. Define the term “Data Type”?
2. List out the advantages of circular queues?
3. Write the advantages of a linked list?
4. What is Stack? Give example.
5. What is sorting? Give one example.

PART B — ($3 \times 7 = 21$ marks)

Answer any THREE questions out of Five questions
in 200 words.

All questions carry equal marks.

6. Explain the Linear Data Structure with example.
7. Write about Array Insertion and Deletion.
8. Briefly explain Operations on Queue using Linked Lists.
9. Write about array representation of Trees.
10. Write about selection sort with necessary examples?

PART C — ($4 \times 10 = 40$ marks)

Answer any FOUR questions out of Seven
questions in 500 words.

All questions carry equal marks.

11. Describe in detail about Matrix Operations.
12. Write in detail about Linked List Implementation with suitable example.
13. Discuss about Graph Traversals with neat diagram.

14. Write about Operations in a Binary Tree.
 15. Explain Implementing Graphs using Adjacency Matrix.
 16. Illustrate Bellman-Ford's Algorithms with neat sketch.
 17. Explain about merge sort with neat diagram.
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