(2024 Batch Onwards)

AH4CUDC254 Reg. No. : | | | | | | | | |

St Aloysius (Deemed To Be University)

Mangaluru

School of Arts and Humanities

(UG Programme)

B.Sc. - SEMESTER IV – Degree Examination

April/May - 2026

ECONOMICS – IV(a)

MATHEMATICS FOR ECONOMICS

Time: 2½ Hours. **Max. Marks: 60**

Note: Graph Sheet will be provided.

SECTION - A

Answer any FIVE of the following: **(5×2=10)**

1. Mention the importance of mathematical economics.
2. What are the limitations of mathematical economics?
3. Find the derivative of the 6.
4. Define producer's surplus.
5. Find the transpose of the following matrix $\begin{bmatrix} 3 & -4 \\ -2 & 0 \end{bmatrix}$
6. What do you mean by market equilibrium?

SECTION - B

Answer any SIX of the following: **(6×5=30)**

7. When price of a commodity is 20 per unit, its demand is 150units. When the price falls to 8 per unit demand expands to 200 units. Calculate price elasticity of demand.
8. An electronic company produces two products, Computers (C) and Printers (P). Their Production Possibility Curve is given by

   $C^2 + 3C + 6P = 120$

   i) Find the maximum number of computers that can be produced.

   ii) Find the maximum number of printers that can be produced.
9. Following are the financial details of 2 companies.

	Company A	Company B
Fixed cost	2500	4500
Price/Unit	100	90
Variable cost/Unit	40	3

Find out the break even, to understand which company (A or B) would be able to make profits.

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10. If C=10+0.55Y
    i) What is the aggregate consumption when disposable income is Rs 10 million?
    ii) When disposable income is Rs 5 million rupees, what proportion of it is consumed?
    iii) When the disposable income is 5 million, what proportion of aggregate consumption is consumption of disposable income?

Contd...2

11. Solve the following equation by Cramer's rule.

    4X+Y=7

    3X+4y=5

12. A company has produced X items. The total cost function TC= $100+0.025X^2$ and the total revenue function TR=5X find the profit function, Average profit function and marginal profit function.

13. The demand function for a product is given by P=$4000-10X-X^2$ find TR, AR and MR.

14. Given the consumption function C= 100+0.75y and investment function I= 250 and government expenditure is G=150 use the IS-LM model and solve it.

SECTION – C

Answer any <u>TWO</u> of the following: **(2×10=20)**

15. If the demand and supply functions for a certain commodity are:

    $D = 30 - 3P$ and $S = -6 + 3P$

    i. Determine the equilibrium price and equilibrium quantity.

    ii. What happens to the equilibrium price and quantity if a tax of Rs 2 per unit is imposed by the government?

    iii. Calculate the total tax revenue received by the government.

    iv. How is the tax burden shared between producers and consumers?

16. Pareto's law of income distribution for a particular group is given by:

    $N = \frac{125 \times 10^9}{X^{1.5}}$

    Find out:

    i) How many people are millionaires?

    ii) How many people have income between Rs 40,000 and Rs 90,000?

    iii) What is the lowest income of the 100 people with the highest income?

17. A firm produces two products $X$and Y. The profit function is: solve the equation by graphically.

    Maximize

    $Z = 5X + 3Y$

    Subject to the constraints:

    $2X + Y \leq 10$

    $X + 2Y \leq 8$

    $X \geq 0, Y \geq 0$

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Part	A						B								C		
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Blooms Level	2	2	3	1	3	2	3	4	3	3	3	4	4	4	5	4	4
Mapped CO(s)	1	1	3	1	2	5	5	5	5	2	3	4	3	5	5	5	4

(2024 batch onwards)

AH4DUAE231

Reg. No: | | | | | | | |

St Aloysius (Deemed to be University)
Mangaluru
SCHOOL OF ARTS AND HUMANITIES
(UG PROGRAMME)
B.A./B.Sc./B.C.A. - Semester IV – Degree Examination
April / May - 2026

Ability Enhancement Compulsory Course
Constitution of India And Value Education

Time: 2½ Hours **Max. Marks: 60**

PART – A

Constitution of India

I. Answer any FIVE of the following questions. **(5x2=10)**

1. Define secularism. When was this term added to the Preamble of the Indian Constitution?
   ಧರ್ಮನಿರಪೇಕ್ಷತೆ ಎಂದರೆ ಏನು? ಈ ಪದವನ್ನು ಭಾರತದ ಸಂವಿಧಾನದ ಪ್ರಸ್ತಾವಿಕೆಯಲ್ಲಿ ಯಾವಾಗ ಸೇರಿಸಲಾಯಿತು?
2. What do you mean by Directive Principles of State Policy? From which country were they borrowed?
   ರಾಜ್ಯದ ನಿರ್ದೇಶಕ ತತ್ವಗಳು ಎಂದರೆ ಏನು? ಇವುಗಳನ್ನು ಯಾವ ದೇಶದಿಂದ ಎರವಲು ಪಡೆದಿದ್ದೇವೆ?
3. Who appoints the Chief Minister in India? Name the present Chief Minister of Karnataka.
   ಭಾರತದಲ್ಲಿ ಮುಖ್ಯಮಂತ್ರಿ ಯನ್ನು ಯಾರು ನೇಮಿಸುತ್ತಾರೆ? ಕರ್ನಾಟಕದ ಪ್ರಸ್ತುತ ಮುಖ್ಯಮಂತ್ರಿಯ ಹೆಸರನ್ನು ತಿಳಿಸಿ.
4. What is impeachment? Can a Governor be removed through the impeachment process?
   ದೋಷಾರೋಪಣೆ ಎಂದರೆ ಏನು? ರಾಜ್ಯಪಾಲರನ್ನು ದೋಷಾರೋಪಣೆ ಪ್ರಕ್ರಿಯೆಯ ಮೂಲಕ ತೆಗೆದುಹಾಕಬಹುದೇ?
5. State any two functions of the Speaker of the Lok Sabha.
   ಲೋಕಸಭೆಯ ಸ್ಪೀಕರ್‌ನ ಯಾವುದಾದರೂ ಎರಡು ಕಾರ್ಯಗಳನ್ನು ತಿಳಿಸಿ.
6. What is unicameralism? Name any one unicameral state in India.
   ಏಕಸದನ ವ್ಯವಸ್ಥೆ ಎಂದರೆ ಏನು? ಭಾರತದ ಯಾವುದಾದರೂ ಒಂದು ಏಕಸದನವನ್ನು ಹೊಂದಿರುವ ರಾಜ್ಯದ ಹೆಸರನ್ನು ಹೆಸರಿಸಿರಿ.
7. Mention any two electoral reforms implemented in India.
   ಭಾರತದಲ್ಲಿ ಜಾರಿಗೊಂಡ ಯಾವುದಾದರೂ ಎರಡು ಚುನಾವಣಾ ಸುಧಾರಣೆಗಳನ್ನು ತಿಳಿಸಿ.
8. Expand RTI and PIL
   RTI ಮತ್ತು PIL ನ ಪೂರ್ಣ ರೂಪವನ್ನು ಬರೆಯಿರಿ.

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II. Answer any FIVE of the following questions. **(5x5=25)**

9. Write a note on Constituent Assembly.
   ಸಂವಿಧಾನ ರಚನಾ ಸಭೆಯ ಬಗ್ಗೆ ಟಿಪ್ಪಣಿ ಬರೆಯಿರಿ.
10. In **Bijoe Emmanuel & Others v. State of Kerala (1986)**, three children belonging to the Jehovah's Witnesses faith refused to sing the National Anthem due to their religious beliefs but stood respectfully. The school expelled them, but the Supreme Court ruled in children's favour.
    A. Identify and explain any one Fundamental Right upheld in this case. (2 Marks)
    B. Analyze any three reasonable restrictions on the Right to Freedom under Article 19(1)(a). (3 Marks)

Contd...2

Bijoe Emmanuel & Others v. State of Kerala (1986) ಪ್ರಕರಣದಲ್ಲಿ, ಮೂರು ಮಕ್ಕಳು ತಮ್ಮ ಧಾರ್ಮಿಕ ನಂಬಿಕೆಯ ಕಾರಣ ರಾಷ್ಟ್ರಗೀತೆಯನ್ನು ಹಾಡಲು ನಿರಾಕರಿಸಿದರು, ಆದರೆ ಗೌರವದಿಂದ ನಿಂತಿದ್ದರು. ಶಾಲೆಯು ಅವರನ್ನು ಹೊರಹಾಕಿತು, ಆದರೆ ಸುಪ್ರೀಂ ಕೋರ್ಟ್ ಮಕ್ಕಳ ಪರವಾಗಿ ತೀರ್ಪು ನೀಡಿತು.

A. ಈ ಪ್ರಕರಣದಲ್ಲಿ ರಕ್ಷಿಸಲಾದ ಯಾವುದಾದರೂ ಒಂದು ಮೂಲಭೂತ ಹಕ್ಕನ್ನು ಗುರುತಿಸಿ ಮತ್ತು ವಿವರಿಸಿ. (2 ಅಂಕಗಳು)

B. ವಿಧಿ 19(1)(a) ಅಡಿಯಲ್ಲಿ ಸ್ವಾತಂತ್ರ್ಯದ ಹಕ್ಕಿನ ಮೇಲೆ ಇರುವ ಯಾವುದಾದರೂ ಮೂರು ಸಮಂಜಸ ನಿರ್ಬಂಧಗಳನ್ನು ವಿಶ್ಲೇಷಿಸಿ. (3 ಅಂಕಗಳು)

11. Explain the procedure for the election of the President of India.
ಭಾರತದ ರಾಷ್ಟ್ರಪತಿಯನ್ನು ಆಯ್ಕೆ ಮಾಡುವ ವಿಧಾನವನ್ನು ವಿವರಿಸಿ.

12. Explain the powers and functions of the Prime Minister of India.
ಭಾರತದ ಪ್ರಧಾನಮಂತ್ರಿಯ ಅಧಿಕಾರ ಮತ್ತು ಕಾರ್ಯಗಳನ್ನು ವಿವರಿಸಿ.

13. Describe the composition and original jurisdiction of the Supreme Court.
ಸುಪ್ರೀಂ ಕೋರ್ಟ್‌ನ ರಚನೆ ಮತ್ತು ಮೂಲ ನ್ಯಾಯವ್ಯಾಪ್ತಿಯನ್ನು ವಿವರಿಸಿ.

14. Examine the functions of the 73rd Constitutional Amendment.
73ನೇ ಸಂವಿಧಾನ ತಿದ್ದುಪಡಿಯ ಕಾರ್ಯಗಳನ್ನು ಪರಿಶೀಲಿಸಿ.

15. Explain the functions of the Election Commission of India.
ಭಾರತದ ಚುನಾವಣಾ ಆಯೋಗದ ಕಾರ್ಯಗಳನ್ನು ವಿವರಿಸಿ.

III. Answer any <u>ONE</u> of the following question. **(1x10=10)**

16. Critically examine the salient features of the Indian Constitution.
ಭಾರತೀಯ ಸಂವಿಧಾನದ ಪ್ರಮುಖ ಲಕ್ಷಣಗಳನ್ನು ಟೀಕಾತ್ಮಕವಾಗಿ ಪರಿಶೀಲಿಸಿ ಬರೆಯಿರಿ.

17. Evaluate the powers of the President of India.
ಭಾರತದ ರಾಷ್ಟ್ರಪತಿಯ ಅಧಿಕಾರಗಳನ್ನು ಮೌಲೀಕರಿಸಿ ಬರೆಯಿರಿ.

18. Explain the composition and powers of the Parliament of India.
ಭಾರತದ ಸಂಸತ್ತಿನ ರಚನೆ ಮತ್ತು ಅಧಿಕಾರಗಳನ್ನು ವಿವರಿಸಿ.

PART – B
VALUE EDUCATION (IV semester)

IV. Answer any <u>ONE</u> of the following in not less than a page. **(1x5=5)**

19. Suggest various methods to promote religious harmony in Mangaluru.
ಮಂಗಳೂರು ನಗರದಲ್ಲಿ ಧಾರ್ಮಿಕ ಸಾಮರಸ್ಯವನ್ನು ಉತ್ತೇಜಿಸಲು ವಿವಿಧ ವಿಧಾನಗಳನ್ನು ಸೂಚಿಸಿ.

20. Define sustainable development and explain its key principles.
ಸುಸ್ಥಿರ ಅಭಿವೃದ್ಧಿ ಎಂದರೆ ಏನು? ಅದರ ಪ್ರಮುಖ ತತ್ವಗಳನ್ನು ವಿವರಿಸಿ.

V. Answer any <u>ONE</u> of the following in not less than two pages. **(1x10=10)**

21. Define professional ethics and explain its key attributes.
ವೃತ್ತಿ ನೈತಿಕತೆ ಎಂದರೆ ಏನು? ಅದರ ಪ್ರಮುಖ ಲಕ್ಷಣಗಳನ್ನು ವಿವರಿಸಿ.

22. Critically analyze the obstacles to take individual responsibility in society.
ಸಮಾಜದಲ್ಲಿ ವೈಯಕ್ತಿಕ ಜವಾಬ್ದಾರಿಯನ್ನು ತೆಗೆದುಕೊಳ್ಳಲು ಇರುವ ಅಡೆತಡೆಗಳನ್ನು ಟೀಕಾತ್ಮಕವಾಗಿ ವಿಶ್ಲೇಷಿಸಿ.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

	A																	B			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Blooms Level	1	1	1	2	1	2	1	1	2	4	2	2	2	4	2	5	5	2	3	2	2	4
Mapped CO(s)	1	1	2	2	3	1	4	4	2	1	3	3	2	4	3	1	3	3	4	4	4	4

(2024 batch onwards)

AH4GUDC260/AH4HUDC261 Reg. No: | | | | | | | | |

St Aloysius (Deemed to be University)
Mangaluru
School of Arts and Humanities
(UG Programme)
B.A./B.Sc. - Semester IV – Degree Examination
April/May - 2026
PSYCHOLOGY
DEVELOPMENT THROUGH LIFE - II

Time: 2½ Hours **Max. Marks: 60**

PART - A

I. Answer any FIVE questions in 2-3 sentences each. **(5x2=10)**

1. What is puberty?
2. Mention the concepts important to understand the psychosocial dynamics of early adulthood.
3. Which is the longest developmental stage in the life span?
4. How would you define a student who has difficulty in reading, writing and basic calculations?
5. What is trigger mechanism?
6. Differentiate the three dimensions of conflict in marriage.

PART - B

Answer any SIX of the following: **(6x5=30)**

7. Evaluate identity in adolescence from James Marcia's perspective.
8. Growth during early adulthood is the result of competence, self-acceptance, and self-actualization. Elucidate .
9. Discuss Late adulthood in terms of life expectancy, age category and theories of ageing.
10. Examine the health concerns of Middle adulthood period.
11. Discuss adolescent sexuality and sexual orientation.
12. Analyze the factors preceding death.
13. Discuss the developmental tasks in early adulthood.
14. Differentiate between Autism Spectrum disorder and ADHD.

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PART - C

Answer any TWO of the following: **(2x10=20)**

15. Analyse the physical changes associated with aging.
16. Evaluate the nature of elimination disorders and discuss the symptoms and causes.
17. Discuss the factors that contribute to adjustment in early years of marriage.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

PART	A						B								C		
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Blooms Level	1	2	1	3	2	4	5	2	2	4	2	4	2	4	4	5	2
Mapped CO(s)	1	2	1	3	4	2	2	2	1	3	2	3	1	4	1	2	3

(2024 Batch Onwards)

AH4JUDC264 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Arts and Humanities

(UG Programme)

B.Sc (Visual Communication)

Semester IV– Degree Examination

April/May-2026

SCRIPTING AND STORY BOARDING

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Define the term "complementary colours" and provide an example of how they can be used to enhance visual contrast in a composition.
2. Make a short list of non-creative methods.
3. What should a scriptwriter carry in his kit to be an effective story writer?
4. What is the role of 'Conflict' in a story?
5. Can you explain the purpose of a continuity board in the context of film production?
6. Define the Rule of Thirds in photography or cinematography.
7. Create a shot with an emphasis on a low angle.

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SECTION - B

Answer any FOUR of the following. **(4x5=20)**

8. What is subtext in script analysis, and how does it differ from the explicit text? Provide an example of how subtext can convey deeper meaning in a script.
9. How do logline, synopsis, and research contribute to the development of a plot? Describe the interplay between these elements and elucidate how they assist in establishing the foundation and coherence of a storyline.
10. Suppose you're tasked with refining the treatment of a crucial plot point in a screenplay, how would you approach this task, considering factors such as character development, thematic resonance, and narrative coherence?
11. Mention the style guide necessary for creating a shooting script.
12. Reflect on the importance of adhering to scriptwriting principles in the creation of compelling narratives. Provide examples of successful scripts that effectively utilize these principles and contrast them with instances where neglecting these principles led to weaker storytelling.
13. Write a script for a documentary on any wild animal of India.

Contd....2

SECTION – C

Answer any THREE of the following. **(3x10=30)**

14. Generate a series of original sketches that demonstrate your understanding of perspective techniques, including one-point, two-point, and three-point perspective. Incorporate elements of the Triangle Principle to enhance the composition of each work. Write a reflective commentary discussing your creative process, the decisions made regarding perspective and composition, and the intended impact on the viewer.
15. Examine the role of divergent and convergent thinking in the creative process, comparing and contrasting their contributions to idea generation and refinement. Evaluate the impact of various environmental factors, such as organizational culture or societal norms, on fostering or hindering creativity.
16. Imagine you are tasked with editing a short film to convey a sense of urgency and tension during a climactic chase scene. Describe the specific montage and editing effects you would use to achieve this goal, such as quick cuts, parallel editing, and sound design techniques. Explain how each chosen effect contributes to building suspense and maintaining the pacing of the scene.
17. Write a screenplay for a short film keeping in mind the five act structure.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

PART	A							B						C			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Blooms Level	1,2	1	3	2	2,4	1	6	2,3	2,4	2,3	1	2,5	6	6,2	4,5	2,5	6
Mapped CO(s)	5	1	3	2	3	3,4	3	1	2	3	1	2	3	3,4	2,3	3,5	3,1

(2024 Batch Onwards)

AH4JUDC265 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Arts and Humanities

(UG Programme)

B.Sc (Visual Communication)

Semester IV – Degree Examination

April/May-2026

SOUND DESIGN FOR VISUAL MEDIA

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. What is echo?
2. What is frequency?
3. Shotgun Microphone
4. Production Console
5. Define live sound mixing.
6. Cubase
7. Pop-filter

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SECTION - B

Answer any FOUR of the following. **(4x5=20)**

8. Explain the importance of vocal control in voice-over.
9. Explain how sound waves behave in different environments.
10. Explain the differences between dialogue, sound effects, and music in a sound mix.
11. Analyze how sound behaves in open space vs closed space.
12. Explain different types of microphones.
13. Explain the working of a boom microphone in film shooting.

SECTION – C

Answer any THREE of the following. **(3x10=30)**

14. Discuss the role of diegetic and non-diegetic sound in shaping audience perception. Support your answer with examples from two films or television shows.
15. Discuss how vocal elements contribute to persuasion in advertising.

Contd....2

16. What are the major challenges sound designers face in film and television production, and how do they overcome them?
17. What are the different types of audio cables used in recording and production?

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

PART	A							B						C			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Blooms Level	2	1	1	2	2	1	1	3	3	5	3	1	2	3	3	5	2
Mapped CO(s)	1	1	2	3	3	2	1	2	2	1	2	3	1	1	2	3	2

(2024 Batch Onwards)

AH4JUDC266 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Arts and Humanities

(UG Programme)

B.Sc (Visual Communication)

Semester IV – Degree Examination

April/May-2026

THEORIES OF VISUAL COMMUNICATION

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Who is called the Father of Rhetoric?
2. Who proposed dyadic model?
3. What is hegemony?
4. What is an index?
5. What is a visual symbol?
6. Analyze Rhizomatic Visual Communication in relation to tradition communication model.
7. What is Ecological theory of Visual Communication?

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

8. Analyse the cognitive dissonance with suitable example.
9. Apply logos, pathos, and ethos to analyze an Environmental Campaign.
10. Explain how critical theory views power and domination in society.
11. Explain the concept of ethical voice in Plato's philosophy.
12. How is Gestalt theory used in advertising design?
13. Explain the Huxley-Lester Model of Communication.

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SECTION – C

Answer any THREE of the following. **(3x10=30)**

14. Analyze the functions of mass communication and discuss their significance in modern society.
15. Analyze how the "Social Meaning of Photography" influence public perception of social issues.
16. Illustrate with examples how Phenomenology Theory can be applied to real life situations to understand individual and collective experiences.
17. Explain Common Propaganda techniques used in Media with examples.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

PART	A							B						C			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Blooms Level	2	2	2	2	2	4	2	4	3	3	2	4	2	4	4	4	2
Mapped CO(s)	4	4	4	2	3	5	5	5	4	1	4	3	5	1	3	2	1

(2024 Batch Onwards)

CF5AUSE228 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

SCHOOL OF COMMERCE, FINANCE AND ACCOUNTANCY

(UG PROGRAMME)

B.A./B.Sc./B.C.A.–Semester IV- Degree Examination

April/May – 2026

(Skill Enhancement Course)

FINANCIAL EDUCATION AND INVESTMENT AWARENESS

Time: $1\frac{1}{2}$ Hours **Max Marks: 30**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Expand the term GDP.
2. In which year RBI was established?
3. What is a mutual fund?
4. Write a note on NPS.
5. What is Bond.
6. Expand PMKMDY.
7. What is a credit card?

SECTION - B

Answer any TWO of the following. **(2x5=10)**

8. Explain any five needs for banking in India.
9. Explain any five micro environment factors influencing investment decisions.
10. Describe the criteria for selection of Mutual Funds.
11. What is Demat Account?

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SECTION – C

Answer any ONE of the following. **(1x10=10)**

12. Calculate: a) i) Future Value of ₹12,000 at 5% p.a. for 4 years ii) Present Value of ₹18,000 receivable after 3 years at 10% p.a.
    b) Write a note on NEFT and RTGS
13. Explain fundamental analysis.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Part	A							B				C	
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Blooms Level	1	1	1	1	1	1	1	4	4	4	2	3	4
Mapped CO(s)	1	1	2	3	3	3	1	1	1	2	3	1	2

(2024 Batch Onwards)

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School of Information Science and Technology

(UG Programme)

B.A./B.Sc. - Semester IV - Degree Examination

April/May - 2026

COMPUTER ANIMATION

3D MODELLING

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Name any 2 Boolean methods.
2. What is the difference between cut & quick slice?
3. What are the uses of segments?
4. How to give outline for spline objects?
5. What is the use of refine?
6. Name any 4 types of Doors.
7. What is the use of nurbs create surface tool?

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

8. Write a short note on doors & windows.
9. What are the benefits of using Maya?
10. Explain the steps to create Lock & key.
11. Write a short note on Foliage.
12. What is Shape merge & Face Extrude?
13. Explain the steps to create sandals.

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SECTION – C

Answer any TWO of the following. **(2x15=30)**

14. Explain briefly about 3D modifiers.
15. Write a note on editable spline.
16. Explain briefly about AEC extended objects.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

PART	A							B						C		
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Blooms Level	1	2	3	2	3	1	2	2	3	3	2	1	1	2	3	2
Mapped CO(s)	4	2	1	3	1	2	4	3	2	2	3	3	4	4	1	3

(2024 Batch Onwards)

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School of Information Science and Technology

(UG Programme)

B.Sc. (Computer Science) - Semester IV – Degree Examination

April/May - 2026

OBJECT ORIENTED CONCEPTS USING JAVA

Time: 2 ½ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Define a) encapsulation b) data binding
2. Why do we need import statement in Java?
3. Differentiate method overloading with method overriding.
4. How does string class differ from string buffer class?
5. Name any four exceptions in Java.
6. Differentiate between Byte Stream and Character Stream.
7. Define Deserialization.
8. List the four types of JDBC drivers.

SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Explain the following operators in Java. i) logical ii) increment and decrement
10. What are command line arguments? Explain with an example.
11. What are the features of Java? Explain.
12. What is Inheritance? Explain different types of inheritance with example.
13. Write a note on visibility control.
14. What is an interface? How do we extend and implement interfaces in java?
15. Define an exception. How it is handled?
16. Name any three common exceptions in Java.
17. Explain following file operation. a) create a file b) read form a file
18. Explain the steps involved in communicating with a database using JDBC API.
19. Explain life cycle of a thread with neat diagram.
20. Define JDBC. What are the main components of JDBC architecture?

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A								B											
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	1	2	2	2	1	2	1	1	2	3	2	3	2	3	2	1	3	3	2	2
Mapped CO(s)	2	1	2	2	3	3	4	4	1	1	1	2	2	2	3	3	3	4	4	4

(2024 Batch Onwards)

IT3DUDC250 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

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School of Information Science and Technology
(UG Programme)
B.Sc. (Data Science) – Semester IV – Degree Examination
April/May - 2026
DATA SCIENCE WITH R

Time: 2 ½ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Define the pipe operator %>% in R.
2. Define Unstructured data with example.
3. What is Data science?
4. What is the role of aes() in ggplot2?
5. Define Nominal scale with example
6. What is correlation?
7. What is a hypothesis?
8. Which function is used to create a new column in dplyr?

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SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Explain the different special values in R with examples.
10. Elaborate the steps of the Data Analytics Life Cycle with a suitable diagram.
11. Write an R program to perform matrix addition and subtraction.
12. What is function in R? Explain with an example.
13. Write a program in R to compute the factorial of a given number using a loop.
14. Which functions are used in R to read and write CSV files? Give examples.
15. What are the four scales of measurement in statistics? Briefly explain each with examples.
16. The marks of 1000 students in an examination follows normal distribution (ND) with mean 70 and variance 25. Construct the no. of student who's marks will be (a) Less than 65 (b) More than 75 (c) Between 65 & 75.
17. Calculate mean and median for the following data pertaining to marks in statistics out of 140 marks for 80 students in class.

Marks	0-20	20-40	40-60	60-80	80-100	100-120	120-140
No. of students	4	26	22	10	9	6	3

18. A school wants to test whether a special coaching program improves students mathematics scores. The marks of 8 students were recorded before and after the program. Test at the 5% level of significance whether the coaching program improved marks.

Contd...2

student	before	after
1	45	50
2	52	58
3	48	54
4	60	65
5	55	59
6	50	55
7	47	53
8	58	63

19. A high school counsellor wants to determine if there is a predictable relationship between the number of hours a student spends studying for a final exam (X) and the marks they obtain (Y) out of 100. Calculate the Regression Equation. What mark would a student be expected to receive if they studied for 7 hours.

Student	1	2	3	4	5
X(Hours studied)	2	4	6	8	10
Y (Marks)	40	50	60	70	80

20. The following data relate to age of employees and the number of days they reported sick in a month.

Employees	1	2	3	4	5	6	7	8	9	10
Age	30	32	35	40	48	50	52	55	57	61
Sick days	1	0	2	3	2	4	6	5	7	8

Construct Karl Pearson's coefficient of correlation and interpret it.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A								B											
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	2	1	1	2	2	1	1	3	2	2	3	2	3	3	2	3	3	4	4	4
Mapped CO(s)	2	1	1	2	3	4	4	2	2	1	2	2	2	2	3	3	3	4	4	4

(2024 Batch Onwards)

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School of Information Science and Technology

(UG Programme)

B.Sc. (Data Science) – Semester IV – Degree Examination

April/May - 2026

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Time: 2 ½ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Define Linear Regression. Write its mathematical equation.
2. What is outlier analysis?
3. What is meant by an AI problem? List any two characteristics of AI problems.
4. What is Linear Discriminant Analysis (LDA)?
5. What is Logistic Regression? Give its equation.
6. What is a problem space? Mention its elements in search strategies.
7. What is reinforcement learning? State its basic concept.
8. What is Unsupervised Learning? Give one example.

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SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Explain Model based Agent along with the daigram.
10. Differentiate between Sensors, Percepts, Effectors, and Actions.Illustrate your answer with a suitable example.
11. Explain the different types of AI problems such as search problems, knowledge representation, reasoning, and learning problems with examples.
12. Describe the steps involved in the LDA algorithm with an example.
13. Define Machine Learning.Explain how Machine Learning is different from traditional programming with suitable examples.
14. What is Principal Component Analysis ?describe the steps involved in the PCA algorithm.
15. Define Supervised Learning.Explain its types with suitable examples for classification and regression.
16. Explain the Naïve Bayes Classification algorithm.Describe Prior, Likelihood, Posterior probabilities.
17. Differentiate between Simple Linear Regression, Multiple Linear Regression, and Polynomial Regression.
18. Explain the KD-Tree .Describe How KD Tree Alogrithm Works along with an example.
19. Explain utility based agent along with a neat diagram.
20. Explain the K-Medoids algorithm. Mention its advantages and disadvantages.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A								B											
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	1	1	2	2	1	2	2	1	2	2	2	3	2	3	2	3	2	3	2	3
Mapped CO(s)	3	4	1	3	3	1	4	2	1	1	1	3	2	3	2	3	3	2	4	4

(2024 Batch Onwards)

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School of Information Science and Technology

(UG Programme)

B.Sc. (Data Science) – Semester IV – Degree Examination

April/May - 2026

DATA COMMUNICATION AND NETWORK

Time: 2 ½ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Differentiate data and signal.
2. List the causes of transmission impairment.
3. Write any two advantages of layered network architecture.
4. Mention the layers of the TCP/IP model.
5. Calculate the Hamming distance between the codeword 10000 and 0000.
6. Differentiate between multiplexing and demultiplexing.
7. Define data communication. List three characteristics of an efficient data communication system.
8. List types of broadcast networks.

SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Compare LAN, MAN and WAN based on any five parameters.
10. Outline the five components of a communication system.
11. Distinguish between simplex and half-duplex transmission modes.
12. Describe NRZ-L and NRZ-I encoding techniques.
13. Explain analog signal with its characteristics.
14. Explain transmission impairments and its causes.
15. Explain the different actions performed by a firewall on network traffic.
16. Write a note on internet working. Explain its three types.
17. Explain the functions of the Physical and Data Link layers of OSI model.
18. Explain Frequency Division Multiplexing (FDM) with working, advantages and disadvantages.
19. Explain two-dimensional parity check with working principle.
20. Explain message switching.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A								B											
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	L2	L1	L1	L1	L3	L2	L1	L1	L2	L1	L2	L2	L2	L2	L3	L2	L2	L3	L3	L2
Mapped CO(s)	1	1	2	2	3	2	1	1	1	1	2	2	1	1	4	2	2	3	3	4

(2024 Batch Onwards)

LS2AUDC250 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Life Sciences (UG Programme)

B.Sc. (Botany) Semester IV – Degree Examination

April/May - 2026

ECOLOGY AND CONSERVATION BIOLOGY

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Define/Answer any FIVE of the following. **(5x2=10)**

1. Eastern Himalayas is a biodiversity hotspot. Give reasons.
2. Write any two important anatomical features of *Casuarina* stem.
3. Differentiate between natality and mortality.
4. What is Physiognomy?
5. What is biodiversity act?
6. Define phytogeographical region.

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

7. Mention any five IUCN plant categories with special reference to Karnataka.
8. Differentiate between a) Ecotone b) Ecotype
9. Explain the morphological features of the following
   a) *Pistia* b) *Hydrilla*
10. What is vegetation? Highlight on mangrove forests of Karnataka.
11. Describe abiotic components of pond ecosystem.

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SECTION – C

Answer any THREE of the following. **(3x10=30)**

12. Botanical gardens, seed banks, gene banks, pollen banks, culture collections are methods of Ex-situ conservation. Justify.
13. Define ecological succession. Explain the various stages.
14. Explain Vavilov's centres of plant origin.
15. What is soil profile? Explain the various horizons.

****

Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A						B					C			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Blooms Level	4	2	4	2	1	1	1	4	2	2	1	4	2	1	2
Mapped CO(s)	4	1	2	2	4	3	4	2	1	3	2	4	2	3	1

(2024 Batch Onwards)

LS2BUDC251 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Life Sciences (UG Programme)

B.Sc. (Zoology) Semester IV – Degree Examination

April/May-2026

GENE TECHNOLOGY, IMMUNOLOGY AND COMPUTATIONAL BIOLOGY

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Define gene manipulation.
2. What are restriction enzyme? Mention its applications.
3. Write a note on DNA sequencing.
4. Differentiate between pharmacogenomics and pharmacogenetics.
5. Define standard derivation.
6. Mention the types of Antibodies.

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

7. Elaborate the mechanism of liposome-mediated gene transfer.
8. Write a note on gene therapy.
9. What are the different steps involved in DNA fingerprinting?
10. Briefly describe the line graph and pie chart and give an example of their application in Zoological Studies.
11. Draw a neat labeled diagram of a payers's patches and mention its functions.

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SECTION – C

Answer any THREE of the following. **(3x10=30)**

12. Write a note on the main characteristic features of a cloning vector. Describe the different types of vectors used in genetic engineering.
13. Explain different steps involved in Enzyme production.
14. Describe the concept of central tendency In statistics and its importance.
15. Discuss the mechanism of innate immune response.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A						B					C			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Blooms Level	1	1	1	2	1	1	2	1	2	3	2	2	2	3	4
Mapped CO(s)	2	2	2	2	4	3	2	2	2	4	3	2	1	4	3

(2024 Batch Onwards)

LS2CUDC252 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Life Sciences (UG Programme)

B.Sc. (Biotechnology) Semester IV – Degree Examination

April/May - 2026

MOLECULAR BIOLOGY

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Define/Answer any FIVE of the following. **(5x2=10)**

1. Mention two features of ZDNA.
2. What is mismatch repair?
3. Define the origin of replication.
4. Compare between polycistronic and monocistronic mRNA.
5. What is depurination? Give an example.
6. Justify how Wobble phenomenon enhances efficiency in protein synthesis.

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

7. Describe chromatin structure.
8. Explain the consequences of DNA damage.
9. Illustrate the role of codons in decoding of genetic information.
10. Describe the structure and function of the Lac operon.
11. Discuss the role of transcription factors in Eukaryotic transcription.

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SECTION – C

Answer any THREE of the following. **(3x10=30)**

12. Describe the steps in prokaryotic DNA replication.
13. Give an account on base excision repair mechanism.
14. Illustrate the process of transcription in prokaryotes.
15. Explain various post translational modifications of proteins.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A						B					C			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Blooms Level	2	2	2	3	2	5	2	2	4	3	3	3	3	5	2
Mapped CO(s)	1	2	1	3	2	4	1	2	3	4	3	1	2	3	4

(2024 Batch Onwards)

LS2DUDC253 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Life Sciences (UG Programme)

B.Sc. (Microbiology) Semester IV – Degree Examination

April/May - 2026

MICROBIAL ENZYMOLOGY AND METABOLISM

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Define/Answer any FIVE of the following. **(5x2=10)**

1. What are Lysozymes?
2. What is Km value for an enzyme?
3. Enzymes involved in Hetero lactic acid fermentation.
4. Leg haemoglobin.
5. Importance of cyanobacteria.
6. What is quorum sensing?

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

7. Discuss about Nitrogenase complex.
8. Compare different types of microbial photosynthetic pigments.
9. Write a note on cofactor specificity of enzymes.
10. Analyze the characteristics of non-competitive inhibition.
11. Dissect ethanol fermentation pathway.

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SECTION – C

Answer any THREE of the following. **(3x10=30)**

12. Appraise two component signal transduction in bacteria.
13. Assess biochemistry of nitrogen fixation.
14. Contrast light reaction with cyclic and noncyclic photophosphorylation.
15. Explain the theories proposed for ES complex formation.

****

Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Part	A							B				C			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Blooms Level	2	2	2	4	1	2	2	5	5	4	4	5	5	5	2
Mapped CO(s)	1	1	4	2	3	3	3	4	1	1	2	2	3	4	1

(2024 Batch Onwards)

LS2FUDC255 Reg. No. : | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Life Sciences (UG Programme)

B.Sc. (Food Science) Semester IV – Degree Examination

April/May - 2026

FUNDAMENTALS OF FOOD CHEMISTRY AND MICROBIOLOGY

Time: 2½ Hours **Max. Marks: 60**

SECTION – A

Define/Answer any FIVE of the following. **(5x2=10)**

1. What is Caramelization reaction? Give examples.
2. Define Proteins. Give examples.
3. What do you mean by thermal degradation of lipids?
4. Briefly write on interesterification, and why is it done?
5. Briefly write theory of Spontaneous generation?
6. What are food borne illnesses?

SECTION - B

Answer any FOUR of the following. **(4x5=20)**

7. How do probiotics help in controlling harmful microbes in food and the human gut?
8. Explain the different classifications of microbial toxins.
9. Describe the physical and chemical agents for control of micro-organism.
10. Explain Gelatinization and Retrogradation with examples.
11. Discuss the different chemical properties of lipids.

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SECTION – C

Answer any THREE of the following. **(3x10=30)**

12. Write a note on Major and trace Minerals.
13. Elaborate on Microbial Growth Curve and its Significance.
14. Discuss on the Historical developments of Microbiology.
15. Explain in detail the scope and Importance of food chemistry.

****

Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Part	A						B					C			
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Blooms Level	1	1	2	2	2	1	4	3	5	4	4	5	3	2	5
Mapped CO(s)	1	1	2	2	3	4	3	4	3	1	2	2	3	3	1

(2024 Batch Onwards)

PS1AUDC250 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Physical Sciences (UG Programme)

B.Sc. (Physics) - Semester IV – Degree Examination

April/May - 2026

THERMAL PHYSICS AND ELECTRONICS

Time: 2 ½ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Define isobaric and isochoric process.
2. Mention any two applications of the First law of thermodynamics.
3. What is the role of magnetic field in adiabatic demagnetization?
4. What is cut-in (knee) voltage in diode?
5. Define operating point (Q-point) of a transistor.
6. State any two advantages of JFET over BJT.
7. Define CMRR (Common Mode Rejection Ratio) and slew rate of OPAMP.
8. State any two laws of Boolean algebra.

SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Classify thermodynamic systems and give detailed explanation for each type.
10. Derive the expression for efficiency of Carnot heat engine.
11. A quantity of dry air at 40°C is suddenly compressed to 1/4 of its original volume. Find the change in temperature. Assume γ = 1.4 for dry air.
12. What is Joule–Thomson effect? Explain using porous plug experiment.
13. What is adiabatic demagnetization? Explain how it leads to cooling.
14. Explain the formation of energy bands in solids and distinguish between conductor, semiconductor, and insulator.
15. Derive the expression for efficiency of a half-wave rectifier.
16. Draw and explain the input and output characteristics of a transistor in common emitter mode.
17. A transistor is biased using a voltage divider network with $V_{CC}=12\,V$, $R_1=60\,k\Omega$, $R_2=20\,k\Omega$, $R_C=2\,k\Omega$, $R_E=1\,k\Omega$, and current gain $\beta=100$. Assuming $V_{BE}=0.7\,V$, calculate the base voltage, emitter voltage, emitter current, collector current, and collector-emitter voltage.
18. Draw the neat, labelled circuit diagram of an inverting amplifier and derive the expression for its voltage gain.
19. State De-Morgan's theorems and prove them using truth tables and logic circuits.
20. Convert the following:
    (a) $(1100.101)_2$ to decimal
    (b) $(254)_{10}$ to hexadecimal.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A								B											
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	2	3	3	2	3	4	3	3	3	3	4	3	4	4	3	4	4	3	3	4
Mapped CO(s)	1	1	1	2	2	3	3	4	1	1	1	2	2	2	2	3	3	3	4	4

(2024 Batch Onwards)

PS1BUDC251 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Physical Sciences (UG Programme)

B.Sc. (Chemistry) Semester IV – Degree Examination

April/May - 2026

INORGANIC AND PHYSICAL CHEMISTRY - II

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. Define radius ratio. What is radius ratio for an ionic compound with coordination number 6?
2. What is the shape of NH_3 and BF_3?
3. What is the bond order and magnetic property of N_2 molecule?
4. Give any two differences between bonding and anti-bonding molecular orbitals.
5. State first law of thermodynamics. Write its mathematical form.
6. Define the Joule–Thomson coefficient. What does the μ_{JT} sign indicate about whether a gas cools or heats during throttling?
7. Define activated complex with the help of an energy profile diagram.
8. Give the Arrhenius equation. Explain the terms.

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SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Illustrate the Born-Haber cycle by taking Sodium Chloride as an example.
10. Explain the factors affecting polarization of ions.
11. Describe d^2sp^3 hybridization with reference to $[Co(NH_3)_6]^{3+}$.
12. Differentiate conductors, semiconductors and insulators using band theory.
13. Discuss the bonding, bond order and magnetic nature of NO molecule.
14. Mention any 5 postulates of VSEPR theory.
15. Explain the working of Carnot's heat engine and find the total work done.
16. Explain intermediate compound formation theory of catalysis with an example.
17. Two moles of ideal gas is heated from 100K to 350K. Calculate change in entropy if a) volume is kept constant b) pressure is kept constant. Given: C_v=1.5R.
18. Explain the principle and procedure for the determination of degree of dissociation and dissociation constant of a weak acid.
19. How transport number is determined by moving boundary method? Explain with an example.
20. Derive an expression for rate constant of a second order reaction with equal concentrations.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A								B											
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	1	2	2	2	1	1	2	1	2	3	2	2	2	2	3	2	4	3	3	3
Mapped CO(s)	1	1	2	2	3	3	4	4	1	1	2	2	2	3	3	3	3	4	4	4

(2024 - Batch onwards)

PS1CUDC252 Reg No : | | | | | | | | |

St Aloysius (Deemed to be University), Mangaluru

School of Physical Sciences

(UG Programme)

B.Sc. Semester IV - Degree Examination

APRIL/MAY - 2026

Mathematics - IV

Partial Differential Equations and Integral Transforms

Time : 2½ Hours **Max. Marks : 60**

SECTION - A

Answer any FIVE of the following. **(5x2=10)**

1. Solve: $p+q=\frac{z}{a}$.
2. Form a PDE by eliminating a, b from $z=a(x+y)+b$.
3. Solve: $u_{xx}-u_{yy}=0$.
4. Classify the PDE $u_{xx}-2u_{yy}+u_{xy}=0$.
5. Find $L\{cos^2 kt\}$.
6. Find $L\{sin2t\ cos2t\}$.
7. Find $L^{-1}\{\frac{2s+3}{s^2+4}\}$.
8. Find $L^{-1}\{\frac{1}{s(s+a)}\}$.

SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Form a PDE by eliminating the arbitrary function ϕ from $\phi(x+y+z, x^2+y^2-z^2)=0$.
10. Solve: i.$p-3x^2=q^2-y$ ii. $yp=2yx+log(q)$.
11. Solve: $p+3q=5z+tan(y-3x)$.
12. Derive the Laplace Equation by the method of seperation of variables.
13. Solve: $(4D^2-4DD'+D'^2)z=16log(x+2y)$.
14. Solve: $(2D^2+D'^2)z=30(2x+y)$.
15. Evaluate $L\{t(3sin2t-2cos2t)\}$.

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16. Find $L\{\phi(t)\}$, where $\phi(t)=\begin{cases} t^2, & 0<t<2 \\ 6, & t>2 \end{cases}$.
17. Find the $L\{f(t)\}$, where $f(t)=\begin{cases} t, & 0<t<1, \\ 0, & 1<t<2 \end{cases}, f(t+2)=f(t)$.
18. Evaluate :

    $i) L^{-1}\{\frac{s}{(s+a)^2-b^2}\}$.

    $ii) L^{-1}\{\frac{s}{(s+3)^2}\}$.
19. Find: $L^{-1}\{\frac{s}{(s^2+4)(s^2+1)}\}$.
20. Solve the differential equation $x''(t)+2x'(t)+x(t)=3te^{-t}, x(0)=0, x'(0)=2$.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

	A								B										
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	3	4	4
Mapped CO(s)	1	1	2	2	3	3	4	4	1	1	1	2	2	2	3	3	3	4	4	4

(2024 Batch Onwards)

PS1DUDC253 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Physical Sciences (UG Programme)

B.Sc. (Statistics) Semester IV – Degree Examination

April/May - 2026

Statistical Inference - I

Time: $2^1/_2$ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. If T is unbiased for θ, show that $\sqrt{T}$ is biasd for $\sqrt{\theta}$.
2. Define Efficiency and relative efficiency of an estimator.
3. Define an estimate with an example.
4. Write the small sample confidence interval for estimating the difference between the two population means.
5. Define critical region and acceptance region.
6. What do you mean by a statistical hypothesis?
7. Write the paired-t test statistic.
8. Write any 2 applications of NP lemma.

SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Find an unbiased estimator for the parameter p when the observations are drawn from a Binomial distribution.
10. Find the sufficient statistic for the parameters of normal distribution.
11. Prove that the relative efficiency of $X_{(1)}$ over $X_{(n)}$ is unity when a sample is drawn from $U(0,\theta)$.
12. Let a random sample of size n is drawn from $N(\theta,1)$ Show that $T=\frac{\sum_{i=1}^{n}x_i^2}{n}$ is an unbiased estimator of $(1+\theta^2)$.

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13. Find the sufficient statistic for the parameter m, when the observations are drawn from $\beta(m,1)$.
14. Derive the $100(1-\alpha)\%$ confidence interval for estimating the difference between the two population proportions when two sample are drawn from two independent normal populations.
15. Derive the $100(1-\alpha)\%$ confidence interval for estimating the difference between the two population means when two large samples are drawn from two independent normal populations.
16. Find the moment estimator of the parameter when the observations are drawn from a Poisson distribution.

Contd...2

17. Find the maximum likelihood estimator of the parameter θ when the observations are drawn from an exponential distribution with pdf $f(x) = \theta e^{-\theta x}; x > 0, \theta > 0.$

18. A sample of size n is drawn from (μ, σ^2) . Derive the BCR for testing $H_0 : \sigma = \sigma_0$ against $H_1 : \sigma = \sigma_1$.

19. Explain the small sample test procedure for testing population mean.

20. Explain the test procedure for testing the hypothesis $H_0 : P = P_0$ against $H_1 : P \neq P_0$ where P is the population proportion of a Normal population.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A								B											
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	2	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	4	2	2
Mapped CO(s)	1	1	2	2	3	3	4	4	1	1	1	1	1	2	2	3	3	3	4	4

(2024 Batch Onwards)

PS1EUDC254 Reg. No.: | | | | | | | | |

St Aloysius (Deemed to be University)

Mangaluru

School of Physical Sciences (UG Programme)

B.Sc. (ELECTRONICS) - Semester IV– Degree Examination

April/May - 2026

ELECTRONICS - IV

ELECTRONIC COMMUNICATIONS, MICROPROCESSORS AND DIGITAL DESIGN USING VERILOG

Time: 2 ½ Hours **Max Marks: 60**

SECTION – A

Answer any FIVE of the following. **(5x2=10)**

1. A coaxial cable has a capacitance of 29.5 pf/m and inductance of 73.75mH/m. Calculate the characteristic impedance for a 1km section.
2. Give the expression for the Characteristic impedance of a)Parallel wire and b) Coaxial line.
3. Draw the circuit diagram of IF amplifier.
4. Ddetermine height and width of a tv screen of 70 inch size.
5. Draw the block diagram of a microprocessor.
6. Mention the interrupts of 8085 MP.
7. Write a Verilog program to implement a 2-input AND gate.
8. Mention any four features of HDL.

SECTION - B

Answer any TEN of the following. **(10x5=50)**

9. Define standing wave ratio (SWR) and Reflection Coefficient. Derive the relation between Reflection Coefficient and standing wave ratio. Hence give the range for both.
10. With necessary diagram explain Ground wave propagation of radio waves.
11. With a neat diagram explain "Transponder" of a satellite.
12. With a neat diagram explain the working of a Plumbicon camera tube.
13. For a channel lying in the range (61-68)MHz, determine
    i) The value of picture carrier frequency,
    ii) The value of sound carrier frequency
    iii) The value of SIF and VIF,
    iv) Draw the channel diagram

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14. With a block diagram explain the Superheterodyne radio receiver used in radio communication.
15. Draw a labelled pin diagram of 8085 MP.
16. Draw the Labelled diagram of architecture of a general microprocessor.

Contd...2

17. With syntax and example explain any three data transfer instructions of 8085MP.
18. Draw the block diagram of a digital computer and explain its functioning.
19. With syntax and example explain any three data transfer instructions of 8085MP.
20. Draw the Labelled diagram of architecture of a general microprocessor.

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Mapping of Questions with Bloom's Level and Course Outcomes (COs)

Section	A								B											
Q. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Blooms Level	1	2	1	3	2	2	4	3	5	4	4	5	4	2	3	4	2	2	4	4
Mapped CO(s)	1	1	2	2	3	3	4	5	1	1	2	2	3	3	4	4	5	5	3	4