

- Total number of relation on given set
- Total number of function on a given set
- Determine whether the given relation as reflexive, symmetric and transitive.
- Show that the given relation is an equivalence relation and find all equivalence class. *Smarks q5!*
- Domain and range of a function.
- State whether the given function is bijective or not.
- Total number of equivalence relation and bijective functions.

Example: Q3, Q5, Q11

Exercrise 1.1: Q1 (iii, iv), Q2, Q3, Q5, Q8, Q9, Q12, Q14, Q15

Exercrise 1.2: Q3, Q4, Q5, Q7, Q8, Q9, Q10

Miscellaneous: Q1, Q2, Q4

Chapter :- 2 (IT Functions)

- Graph of inverse trigonometric functions
- Finding principal value
- Express in the simplest form

Example: Q2, Q3, Q4, Q6

Exercrise 2.1: Q11, Q12, Q13, Q14

Exercrise 2.2: Q4, Q5, Q7, Q8, Q9, Q11, Q13, Q15

Miscellaneous: Q1, Q6, Q7, Q8, Q9, Q10, Q13, Q14

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Chapter :- 3 (Matrices)

- Construct a matrix of given order and whole elements are given by = $a_{ij} = \frac{(i+j)^2}{2}$
- Mcq's Based on Types of matrix
- Missing values like a, b, c and k using equality of matrices
- Questions based on multiplication of matrix and its properties
- Express the matrix as the sum of a symmetric and a skew by symmetric matrix.
- Questions on properties of symmetric and skew symmetric
- MCQ's on invertible matrix.

Example: Q2, Q3, Q5, Q8, Q10, Q11, Q16, Q17, Q22, Q24, Q25

Exercrise 3.1: Q1, Q2, Q5, Q9, Q10

Exercrise 3.2: Q4, Q5, Q7 (ii), Q10, Q12, Q13, Q16, Q17, Q18, Q21, Q22

Exercrise 3.2: Q6, Q10(iii), Q11, Q12

Miscellaneous: Q1, Q6, Q7, Q8, Q9, Q10, Q13, Q14

Chapter :- 4 (Determinants)

- Show that these points are collinear
- Find the value of k if area of triangle is given
- Using cofactor of elements of given rows and column evaluate the determinant
- Questions based on properties of determinant and adjoint of matrix
- Given that $A^3 - 6A^2 + 11A - 6I = 0$, Hence find the inverse of A using matrix

Example: Q2, Q4, Q5, Q7, Q11, Q13, Q14, Q15, Q18, Q19

Exercrise 4.1: Q4, Q6, Q7, Q8

Exercrise 4.2: Q2, Q3, Q4, Q5

Exercrise 4.3: Q3, Q4, Q5

Exercrise 4.4: Q13, Q14, Q15, Q16, Q17, Q18

Exercrise 4.5: Q15, Q16

Miscellaneous: Q1, Q2, Q3, Q4, Q7, Q8, Q9

Chapter :- 5 (Continuity & Differentiability)

- Find the value of k , a , b if the function continuous or differentiable at $x = a$
- Find all the point of discontinuity of a given function
- Derivative of inverse trigonometric functions
- Logarithmic differentiation
- Derivatives of a function in parametric form
- Second order derivative

Example: Q10, Q13, Q26, Q27, Q28, Q30, Q34, Q36, Q37, Q38, Q39, Q40, Q42, Q43

Exercrise 5.1: Q7, Q8, Q12, Q15, Q17, Q18, Q19, Q23, Q24, Q26, Q30, Q34

Exercrise 5.2: Q6, Q7, Q9, Q10

Exercrise 5.3: Q6, Q13, Q14, Q15

Exercrise 5.4: Q4, Q7, Q10

Exercrise 5.5: Q1, Q2, Q5, Q8, Q10, Q11, Q14, Q15

Exercrise 5.6: Q5, Q7, Q8, Q10, Q11

Exercrise 5.7: Q8, Q9, Q10, Q12, Q13, Q14, Q17

Miscellaneous: Q5, Q6, Q9, Q13, Q14, Q15, Q16, Q17, Q22

Chapter :- 6 (Application of Derivatives)

- Rate of change of quantities
- Find the interval in which the given function is increasing and decreasing
- Verify that the function is increasing or decreasing in the given interval
- Find the absolute maximum and minimum values of a given function
- Word problem on rate of change of quantities and maxima & minima

Example: Q2, Q4, Q5, Q11, Q12, Q13, Q20, Q21, Q25, Q26, Q27, Q29, Q30, Q31, Q32, Q33, Q34, Q37

Exercrise 6.1: Q3, Q4, Q7, Q8, Q10, Q11, Q13, Q14

Exercrise 6.2: Q2, Q5, Q7, Q8, Q9, Q14, Q18, Q19

Exercrise 6.3: Q2, Q3(iii, vi, vii), Q4, Q7, Q8, Q10, Q11, Q17, Q18, Q21, Q22, Q23, Q25, Q26, Q29

Miscellaneous: Q1, Q2, Q3, Q4, Q6, Q8, Q9, Q10, Q11, Q14

Chapter :- 7 (Integrals)

- Integration of trigonometric functions including simplification or substitution

- Integration by partial fraction

- Integration by parts

- Definite integrals using properties

- Integrals of some functions

Example: Q2, Q6, Q9, Q10, Q11, Q12, Q13, Q14, Q16, Q23, Q25(iii), Q27, Q28, Q30, Q31, Q32, Q33, Q34, Q37, Q39, Q40, Q41, Q42

Exercise 7.1: Q11, Q14, Q17, Q20, Q22

Exercise 7.2: Q3, Q9, Q14, Q19, Q20, Q24, Q25, Q26, Q28, Q30, Q33, Q34, Q37, Q38

Exercise 7.3: Q2, Q3, Q4, Q6, Q8, Q12, Q13, Q14, Q16, Q17, Q19, Q20, Q22, Q24

Exercise 7.4: Q15, Q16, Q19, Q23

Exercise 7.5: Q3, Q5, Q6, Q8, Q13, Q15, Q17, Q18, Q19

Exercise 7.6: Q6, Q9, Q10, Q13, Q11, Q14, Q18, Q19, Q22, Q24

Exercise 7.7: Q5, Q6, Q7, Q11

Exercise 7.8: Q9, Q12, Q16, Q17, Q18, Q20

Exercise 7.9: Q2, Q3, Q6, Q7, Q8

Exercise 7.10: Q2, Q3, Q4, Q5, Q6, Q8, Q10, Q12, Q15, Q16, Q21

Miscellaneous: Q2, Q4, Q7, Q8, Q10, Q11, Q15, Q19, Q21, Q23, Q24, Q27, Q28, Q30, Q31, Q32, Q33

Chapter :- 8 (Application of Integrals)

- Area under simple curves

Example: Q1, Q2, Q3, Q4

Exercise 8.1: Q2, Q3, Q4

Miscellaneous: Q1, Q2, Q3, Q5

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Chapter :- 9 (Differential Equations)

- Questions based on degree and order of differential equation
- Differential equations with variable separable
- Homogeneous differential equations
- Linear differential equations ✓
- Find the general and particular of the given differential equations

Example: Q1, Q3, Q5, Q7, Q8, Q9, Q10, Q11, Q13, Q15, Q17, Q18, Q20, Q21, Q22,

Exercise 9.1: Q1, Q3, Q4, Q5, Q11, Q12

Exercise 9.2: Q4, Q6, Q7, Q8, Q9, Q10

Exercise 9.3: Q1, Q4, Q5, Q6, Q7, Q9, Q10, Q11, Q13, Q14

Exercise 9.4: Q2, Q3, Q4, Q6, Q7, Q9, Q10, Q12, Q13, Q15

Exercise 9.5: Q1, Q3, Q4, Q7, Q8, Q9, Q11, Q13, Q14, Q15

Miscellaneous: Q1, Q4, Q5, Q6, Q7, Q8, Q9, Q11, Q12, Q13

Chapter :- 10 (Vector Algebra)

- Questions based on direction ratios and cosines
- Triangle law and parallelogram law of vector addition
- Finding the unit vector
- Questions on section formulae
- Problems on scalar product and vector product and their properties
- Projection of a vector on a line
- Finding the area of triangle parallelogram using vector
- Finding angle between two vectors
- Using vector show that given three points are collinear

Example: Q1, Q4, Q5, Q6, Q8, Q9, Q11, Q13, Q14, Q15, Q21, Q22, Q24, Q25, Q27, Q28, Q29

Exercise 10.1: Q1, Q4, Q5

Exercise 10.2: Q1, Q4, Q5, Q7, Q9, Q10, Q11, Q12, Q14, Q15, Q17, Q18

Exercise 10.3: Q1, Q2, Q3, Q5, Q6, Q8, Q10, Q13, Q16, Q18

Exercise 10.4: Q2, Q3, Q4, Q5, Q8, Q9, Q10, Q12

Miscellaneous: Q1, Q3, Q5, Q6, Q7, Q9, Q10, Q11, Q12, Q13, Q14, Q17, Q18, Q19

Chapter :- 11 (3-D Geometry)

- Question based on direction ratio and direction cosine of a line
- Finding the equations of a line in space
- Angle between two lines
- Distance between two skew lines
- Distance between two parallel lines
- Questions based on finding the foot of perpendicular
- Finding the coordinates of an image of given point
- Find the value of p or any if two lines are parallel or perpendicular

Example: Q1, Q2, Q3, Q4, Q5, Q8, Q9, Q10

Exercise 11.1: Q1, Q3, Q4, Q5

Exercise 11.2: Q2, Q3, Q4, Q6, Q7, Q8, Q9, Q10, Q11, Q13, Q15

Miscellaneous: Q1, Q3

Chapter :- 12 (Linear programming)

- Solve linear programming problems graphically
- Show that the minimum or maximum occurs more than two points

Example: Q1, Q2, Q3, Q4, Q5

Exercise 12.1: Q1, Q3, Q5, Q8, Q9, Q10

Chapter :- 13 (Probability)

- **Conditional probability**
- Multiplication theorem on probability
- Mcqs on independent events
- Bayes' theorem and theorem of total probability
- Questions based on properties related to sets

Example: Q2, Q3, Q5, Q7, Q8, Q9, Q11, Q12, Q13, Q14, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24

Exercise 13.1: Q2, Q4, Q5, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15

Exercise 13.2: Q4, Q5, Q6, Q7, Q9, Q10, Q11, Q12, Q13, Q15, Q16, Q18

Exercise 13.3: Q1, Q3, Q4, Q5, Q7, Q8, Q10, Q11, Q12, Q13, Q14

Miscellaneous: Q2, Q4, Q5, Q6, Q7, Q9, Q11, Q12, Q13

Chapter name	2023	2024	2025
Relations and Functions	5	5	5
Inverse Trigonometric Functions	3	3	3
Matrices	9	9	2
Determinants	1	1	8
Continuity and Differentiability	8	10	9
Application of Derivative	6	11	15
Integrals	11	4	5
Applications of integrals	5	6	4
Differential equations	5	4	2
Vectors algebra	7	5	6
3-D Geometry	7	9	8
Linear programming	5	5	5
Probability	8	8	8
Total marks	80	80	80