

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester B.Sc Degree Examination, April 2025

MAT2CJ101 – Integral Calculus

(FYUGP 2024 Admission)

Time: 2 hours

Max. Marks : 70

**PART – A**

All questions can be attended.  
Each question carries **Three** marks.  
**Ceiling -24 Marks**

		COs	Knowledge Level(KL)	Marks
1	Evaluate $\int \cos^2 x \, dx$ .	CO1	U	3
2	Evaluate $\int \frac{1}{\sqrt{t}} \cos(\sqrt{t} + 1)$ .	CO1	Ap	3
3	Evaluate $\sum_{n=1}^4 n^2 + 3n$ .	CO1	U	3
4	Suppose that $\int_{-2}^1 f(x) \, dx = 4$ $\int_1^3 f(x) \, dx = 2$ and $\int_{-2}^3 g(x) \, dx = 8$ . Find $\int_{-2}^3 (3f(x) + 2g(x)) \, dx$ .	CO1	U	3
5	Find $\frac{dy}{dx}$ if $y = \int_0^{\sqrt{x}} \cos t \, dt$ .	CO1	U	3
6	Evaluate $\int \frac{2y \, dy}{y^2 - 25}$ .	CO2	Ap	3
7	Evaluate $\int_0^{\pi} 3 \cos \frac{x}{2} \, dx$ .	CO1	U	3
8	Find $\frac{d}{dx} (\cos^{-1}(e^t))$ .	CO2	U	3
9	Evaluate $\int_0^1 t e^t \, dt$ .	CO2	U	3
10	Evaluate $\int_0^1 (y^2 + 3y + 9)^{-\frac{1}{2}} (2y + 3) \, dy$ .	CO1	Ap	3

**PART – B**

All questions can be attended.  
Each question carries six marks.  
**Ceiling -36 Marks**

		COs	Knowledge Level(KL)	Marks
11	Find the area of the region between the curve $y = 3x - x^2$ , $0 \leq x \leq 4$ , and the $x$ –axis.	CO3	Ap	6

12	Show that if $f$ is continuous on $[a, b]$ , $a \neq b$ , and if $\int_a^b f(x)dx = 0$ then $f(x) = 0$ at least once in $[a, b]$ .	CO1	U	6
13	Find the derivative of $y = \frac{(2x+3)\sqrt{(x+1)}}{(x^2+3)}$ with respect to $x$ .	CO2	U	6
14	Evaluate $\lim_{x \rightarrow \infty} x^{\left(\frac{1}{x}\right)}$ .	CO2	U	6
15	Evaluate $\int \frac{dx}{4x^2+4x+2}$ .	CO1	Ap	6
16	Evaluate $\int \frac{x+4}{x^2+5x-6} dx$ .	CO1	Ap	6
17	Find the area of the surface generated by revolving the curve $y = \frac{x^2}{9}$ , $0 \leq x \leq 2$ , about the $x$ -axis.	CO3	Ap	6
18	Find the length of the curve $x = \frac{y^4}{4} + \frac{1}{8y^2}$ from $y = 1$ to $y = 2$ .	CO3	Ap	6

### PART - C

Answer any *one* questions.

Each question carries **Ten** mark.

		COs	Knowledge Level(KL)	Marks
19	(a) Find the area of the region between the curve $y = 3 - x^2$ and the line $y = -1$ . (b) Find the volume of the solid generated by revolving the region bounded by $y = x^2$ and the lines $y = 0$ , $x = 2$ about the $x$ axis.	CO3	Ap	10
20	(a) Find the norm of the partition $P = \{1, 1.2, 1.5, 2.3, 2.6, 3\}$ . (b) Let $P$ be a partition of $[0, 2]$ . Express the limit $\lim_{\ P\  \rightarrow 0} \sum_{k=1}^n (c_k^2 + 2c_k) \Delta x_k$ as a definite integral. (c) Find the average value of $f(x) = (x - 1)^2$ on $[0, 3]$ . Does $f$ actually take on this value at some point in the given domain?	CO1	U, Ap	10

1 x 10 = 10 Marks

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
 Second Semester B.Sc Degree Examination, April 2025  
 MAT2MN101 – Differential Equations and Matrix Theory  
 (FYUGP 2024 Admission)

Time: 2 hours

Max. Marks : 70

## PART – A

All questions can be attended.  
 Each question carries **Three** mark.  
**Ceiling -24 Marks**

		COs	Knowledge Level(KL)	Marks
1	Determine whether the differential equation is linear or nonlinear, and state the order: $(1 - x)y'' - 4xy' + 5y = \sin x$	CO1	2	3
2	Write a differential equation with solution: $x^2 + y^2 = 25$	CO1	5	3
3	Solve: $(1 + x)dy - ydx = 0$	CO1	4	3
4	Determine whether the function $f(x) = x^2 + x$ , is even odd or neither.	CO1	4	3
5	Solve $x^2 \frac{dy}{dx} - 2x \frac{dy}{dx} - 4y = 0$	CO1	5	3
6	Find $L(t)$	CO1	4	3
7	Show that the set $P_n$ of polynomials of degree less than or equal to $n$ , is a subspace of $C(-\infty, \infty)$	CO2	5	3
8	Evaluate determinant of the matrix: $\begin{pmatrix} 3 & 5 \\ -1 & 4 \end{pmatrix}$	CO2	3	3
9	Check whether the partial differential equation is parabolic, elliptic or hyperbolic: $\frac{\partial^2 u}{\partial x^2} = \frac{\partial^2 u}{\partial y^2}$	CO3	5	3
10	If $A = \begin{pmatrix} 4 & 0 \\ 2 & 3 \end{pmatrix}$ , find the eigenvalues of $A^{-1}$	CO2	6	3

**PART - B**

All questions can be attended.  
Each question carries six marks.

**Ceiling -36 Marks**

		COs	Knowledge Level(KL)	Marks
11	Solve the initial value problem: $\sqrt{1-y^2}dx - \sqrt{(1-x^2)}dy = 0, y(0) = \frac{\sqrt{3}}{2}$	CO1	5	6
12	Solve $x \frac{dy}{dx} - 4y = x^6 e^x$	CO1	5	6
13	Solve: $(e^{2y} - y \cos xy) dx + (2x e^{2y} - x \cos xy + 2y) dy = 0$	CO1	4	6
14	Expand $f(x) = \begin{cases} 0, & -\pi < x < 0 \\ \pi - x, & 0 \leq x < \pi \end{cases}$ as a Fourier Series	CO3	5	6
15	Evaluate $L^{-1} \left\{ \frac{s^2+6s+9}{(s-1)(s-2)(s+4)} \right\}$	CO1	5	6
16	Show that the vectors $u_1 = (1,0,0), u_2 = (1,1,0), u_3 = (1,1,1)$ form a basis for $R^3$ .	CO2	4	6
17	Find the rank of the matrix: $\begin{pmatrix} 1 & 1 & -1 & 3 \\ 2 & -2 & 6 & 8 \\ 3 & 5 & -7 & 8 \end{pmatrix}$	CO2	3	6
18	Find the eigen values and eigenvectors of the matrix: $A = \begin{pmatrix} 3 & 4 \\ -1 & 7 \end{pmatrix}$	CO2	4	6

**PART - C**

Answer only *one* questions.  
Each question carries **Ten** marks.

		COs	Knowledge Level(KL)	Marks
19	Solve the linear system: $2x + 6y + z = 7$ $x + 2y - z = -1$ $5x + 7y - 4z = 9$	CO2	4	10
20	Using Laplace Transforms, solve the initial value problem, $\frac{dy}{dx} + 3y = 13 \sin 2t, y(0) = 6$	CO1	6	10

**1 x 10 = 10 Marks**

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
Second Semester B.Sc Degree Examination, April 2025

MAT2MN102 – Calculus and Matrix Algebra  
(FYUGP 2024 Admission)

Time: 2 hours

Max. Marks : 70

## Course Outcome Mapping Scheme

Q.NO	1	2	3	4	5	6	7	8	9	10
COS	CO1	CO1	CO1	CO1	CO1	CO1	CO2	CO2	CO3	CO2
Q.NO	11	12	13	14	15	16	17	18	19	20
COS	CO1	CO1	CO1	CO3	CO1	CO2	CO2	CO2	CO2	CO1

## Section A

All Questions can be attended.

(Each Question carries 3 marks-Ceiling marks 24.)

- Evaluate  $\int \frac{\sec x + \cos x}{2 \cos x} dx$ .
- State Mean Value theorem for Integrals and Verify with Example  $f(x) = x^2$  on  $[1,4]$ .
- Evaluate  $\int \frac{1-2t^3}{t^3} dt$ .
- Find the Average value of the function  $f(x) = 2x$  over the interval  $[0,4]$ .
- Evaluate  $\int_0^2 x(x^2 + 1)^3 dx$ .
- Define Level Curves and Level Surface and Give one Example.
- Find the limit,  $\lim_{(x,y) \rightarrow (0,0)} (x^2 + y^2) \ln(x^2 + y^2)$ .
- Find  $\frac{\partial Z}{\partial x}$  and  $\frac{\partial Z}{\partial y}$  if  $Z = x^4 \sin xy^3$ .
- Determine the value of  $x$  and  $y$  for which matrices are Equal  $\begin{pmatrix} x^2 & 1 \\ y & 5 \end{pmatrix} = \begin{pmatrix} 9 & 1 \\ 4x & 5 \end{pmatrix}$
- Solve  $3x_1 - 2x_2 = 4$   
 $x_1 - x_2 = -2$

### Section B

All Questions can be attended.

(Each Question carries 6 marks-Ceiling marks 36)

11. Evaluate i.  $\int x^2\sqrt{x-1}dx$

ii.  $\int \frac{\sec^2 x}{\sqrt{1-\tan^2 x}} dx$

12. Evaluate i.  $\int_0^3 |x-2|dx$

ii.  $\int_{-1}^1 \sqrt{1-x^2} dx$

13. Find the Area of the Region that is enclosed between the Curves  $x = y^2$  and  $y = x - 2$ .

14. Evaluate  $\int e^x \cos x dx$ .

15. Evaluate the limits by converting to Polar

coordinates  $\lim_{(x,y) \rightarrow (0,0)} \sqrt{x^2 + y^2} \ln(x^2 + y^2)$ .

16. Find all the Second order Partial Derivatives of  $f(x,y) = e^{x-y^2}$ .

17. Use Gauss Jordan Elimination to Solve

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

$$4x_1 + x_2 + 3x_3 = 5$$

$$2x_1 - 5x_2 + 7x_3 = 19$$

18. Find the Eigen Values and Eigen Vectors of

$$A = \begin{pmatrix} 5 & -1 & 0 \\ 0 & -5 & 9 \\ 5 & -1 & 0 \end{pmatrix}$$

### Section C

Answer any one Questions

(Each Question carries 10 mark)

19. Evaluate  $\int \frac{2x^2 - 10x + 4}{(x+1)(x-3)^2} dx$

20. Construct an Orthogonal Matrix from the Eigen vectors of the given symmetric matrix

$$A = \begin{pmatrix} 0 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 0 \end{pmatrix}$$

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
 Second Semester B.Sc Degree Examination, April 2025  
 MAT2MN103 – Analysis and Some Counting Principles  
 (FYUGP 2024 Admission)

Time: 2 hours

Max. Marks : 70

**Course Outcome Mapping Scheme**

Q.NO	1	2	3	4	5	6	7	8	9	10
COS	CO1	CO1	CO1	CO1	CO2	CO2	CO3	CO3	CO4	CO4
Q.NO	11	12	13	14	15	16	17	18	19	20
COS	CO1	CO1	CO2	CO2	CO3	CO3	CO4	CO4	CO1	CO3

**Section A (Short Answer Type Questions)**

*All questions can be attended. Each question carries 3 Marks. Overall ceiling 24 Marks.*

- Evaluate the limit of the sequence  $\{a_n\}$ , where  $a_n = \frac{n^2}{2^n - 1}$ .
- Find the sum of the series  $\sum_{n=1}^{\infty} \frac{6}{n(n+3)}$ .
- Determine the convergence or divergence of  $\sum_{n=1}^{\infty} \frac{1}{2 + \sqrt{n}}$ .
- Define absolute and conditional convergence. Give an example for a conditionally convergent series.
- Write the number  $\frac{2-4i}{3+5i}$  in the form  $a+ib$ .
- Sketch the set of points in the complex plane satisfying  $1 \leq |z-1-i| < 2$ .
- Compute  $\lim_{z \rightarrow 3i} \frac{\text{Im}(z^2)}{z + \text{Re}(z)}$ .
- Find  $f'(z)$ , where  $f(z) = (z^4 - 2iz^2 + z)^{10}$ .
- Find the number of distinguishable permutations of the letters in *REARRANGE*.
- A bank password consists of two letters of the English alphabet followed by two digits. How many different passwords are there?

**(Ceiling 24 Marks)**

### Section B (Paragraph/Problem Type Questions)

All questions can be attended. Each question carries 6 Marks. Overall ceiling 36 Marks.

11. State the alternating series test. Use it to show that  $\sum_{n=1}^{\infty} \frac{n}{(-2)^{n-1}}$  converges.
12. Determine whether the series  $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^2}{(n+1)^2}$  converges absolutely or conditionally or diverges.
13. Find the four fourth roots of  $z = 1 + i$ .
14. Find the real and imaginary parts of  $f(z) = \frac{\bar{z}}{z+1}$ .
15. State a sufficient condition for  $f(z)$  to be analytic. Find constants  $a, b$  such that  $f(z) = 3x - y + 5 + i(ax + by - 3)$  is analytic.
16. Verify that  $u(x, y) = x^3 - 3xy^2 - 5y$  is harmonic in the entire complex plane and find the harmonic conjugate function of  $u$ .
17. How many ways can a student choose eight out of ten questions to answer on an exam if the first three questions must be answered?
18. What is the probability of correctly guessing a person's four-digit PIN?

(Ceiling 36 Marks)

### Section C ( Essay Type Questions)

Answer any one question. Each question carries 10 Marks.

19. (a) Use direct comparison test to determine the convergence / divergence of  $\sum_{n=0}^{\infty} \frac{4^n}{5^n + 3}$ .  
(b) Describe the set of points  $z$  in the complex plane that satisfy  $|z| = |z - i|$ .
20. (a) Show that  $f(z) = \bar{z}^2$  is not analytic at any point.  
(b) A fair six-sided die is tossed three times and the resulting sequence of numbers is recorded. What is the probability of the event E that either all three numbers are equal or none of them is a 4?

(1 × 10 = 10 Marks)

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester B.Sc Degree Examination, April 2025

MAT2MN104 – Graph Theory and Automata

(FYUGP 2024 Admission)

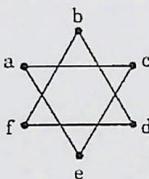
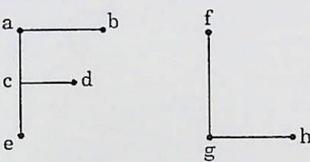
Time: 2 hours

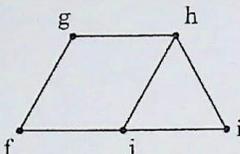
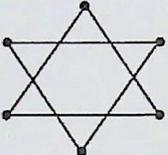
Max. Marks : 70

PART – A

All questions can be attended.  
Each question carries **Three** mark.

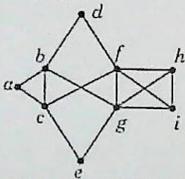
Ceiling -24 Marks

		COs	Knowledge Level(KL)	Marks
1	Is a graph with 5 vertices $a, b, c, d$ and $f$ with $deg(a) = 2, deg(b) = 3 = deg(c), deg(d) = 2$ and $deg(f) = 1$ possible? Justify your answer.	CO 1	Apply	3
2	What is a subgraph of a graph ? Draw $K_3$ and provide an example of its subgraph.	CO 1	Understand	3
3	At an event with 50 guests, each person shakes hands with every other guest exactly once. How many total handshakes occur?	CO 1	Evaluate	3
4	Is the given graph bipartite? Provide justification for your answer.  	CO 1	Evaluate	3
5	Are these two graphs isomorphic? Justify your answer  	CO 1	Analyse	3

6	Consider the following graph G  a) Find a path in G b) Find a cycle in G c) Give an independent set for G	CO 1	Apply	3
7	When is a graph considered Connected? Is the given graph Connected? 	CO 1	Understand	3
8	A connected planar graph has 10 vertices and divides the plane into 7 regions. Determine the number of edges in the graph.	CO 1	Evaluate	3
9	Determine the chromatic number of $K_{3,3}$ .	CO 1	Evaluate	3
10	Compute the length of the word $ab^4$ over $\{a, b\}$ .	CO 3	Evaluate	3

**PART – B**

All questions can be attended.  
 Each question carries six marks.  
 Ceiling -36 Marks

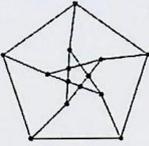
		Cos	Knowledge Level(KL)	Marks
11	What is a simple Graph? Draw $K_3$ and provide its adjacency matrix.	CO 1	Understand	6
12	Using Kruskal's algorithm, find a spanning tree for the graph 	CO 1	Evaluate	6

13	When is a graph considered Eulerian? Is the given graph Eulerian? Justify your answer.	CO 2	Analyze	6
14	Define planar graphs. Is $K_4$ a planar graph? If yes, draw its planar representation.	CO 1	Analyze	6
15	Show that $K_5$ is not a planar graph?	CO 1	Analyze	6
16	Determine the chromatic number of cycle graph $C_n$ .	CO 1	Evaluate	6
17	Let $A = \{0\}, B = \{11\}, C = \{000\}$ and $\Sigma = \{0,1\}$ . Find their Kleene closures.	CO 3	Evaluate	6
18	Define a grammar $G = (N, T, P, \sigma)$ that generates the language $L = \{a^n b \mid n \geq 1\}$ .	CO 3	Evaluate	6

### PART - C

Answer any *one* questions.  
Each question carries **Ten** marks.

		Cos	Knowledge Level(KL)	Marks
19	<p>a) Consider the Graph</p> <div style="text-align: center;"> </div> <p>i. Find the number of vertices and edges in the graph.</p> <p>ii. Find the degrees of the vertices of the graph.</p> <p>iii. Find the adjacency matrix of the graph.</p> <p>b) When is a graph considered Hamiltonian? Is the given graph Hamiltonian? Justify your answer</p> <div style="text-align: center;"> </div>	CO 1, CO 2	Evaluate, Analyze	10

20	<p>a) Verify Euler's formula for the connected planar graph</p>  <p>b) Find degree of regions formed by the graph <math>K_4</math>-</p>	CO 1, CO 2	Understand, Evaluate	10

1 x 10 = 10 Marks

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester B.Sc Degree Examination, April 2025

MAT2FM106(2) – Mathematics for Competitive Examinations Part II

(FYUGP 2024 Admission)

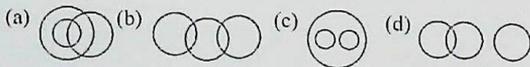
Time: 1.5 hours

Max. Marks : 50

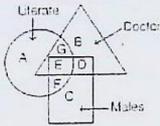
**Answer all questions. Each question carries One mark.**

1. Which number completes the second pair in the same way as the first pair  $542 : 20 :: 976 : ?$   
 (a) 189                      (b) 288                      (c) 169                      (d) 289
2. WRITE is related to JEVGR, in the same way as WRONG is related to  
 (a) JEBAT                      (b) JECA                      (c) JEDAT                      (d) JEDAD
3. Complete the series 1, 0, 3, 2, 5, 6, ?, 12, 9, 20.  
 (a) 9                              (b) 10                              (c) 7                              (d) 8
4. Find the missing term NZ, OY, PX, QW, RV, ?  
 (a) FS                              (b) SU                              (c) UF                              (d) TY
5. Complete the series *ac\_cab\_baca\_aba\_acac*.  
 (a) *aacb*                      (b) *acbc*                      (c) *babb*                      (d) *bcbb*
6. Choose the odd term  
 (a) UA : 22                      (b) CH : 11                      (c) MT : 33                      (d) TX : 55
7. Find the number which is different from others.  
 (a) 892                              (b) 248                              (c) 455                              (d) 714
8. Choose the correct alternative such that the series follow a pattern 23 B\_6\_FG\_5D\_8\_HI  
 (a) W, 8, 7, 1, 6                      (b) C, 7, 4, E, 9                      (c) D, 8, 6, C, 7                      (d) E, 8, 7, D, 9
9. If  $A = 26$  and  $BAG = 71$ , then  $VICE = ?$   
 (a) 69                              (b) 70                              (c) 75                              (d) 90
10. If 'sky' is called 'sea', 'sea' is called 'water', 'water' is called 'air', 'air' is called 'cloud', 'cloud' is called 'river', then what do we drink when thirsty?  
 (a) sky                              (b) air                              (c) water                              (d) sea
11. In a certain code language, '123' means 'bright little boy', '145' means 'tall big boy' and '637' means 'beautiful little flower'. Which digit in that language means 'bright'?  
 (a) 1                              (b) 2                              (c) 3                              (d) 4
12. In a class of 45 students, a boy is ranked 20<sup>th</sup>. When two boys joined, his rank was dropped by one. What is his new rank from the end?  
 (a) 25<sup>th</sup>                              (b) 26<sup>th</sup>                              (c) 27<sup>th</sup>                              (d) 28<sup>th</sup>

13. Consider five people A, B, C, D and E, each having different age. A is younger than only B. C is older than D. D is not the youngest. Who amongst the following are older than C ?  
 (a) A and B (b) E, B and A (c) A and E (d) E and B
14. In a cricket match, Sachin scored more runs than Rahul but not as many as Kiran. Vinod scored less than Rahul but not as many as Kiran. Vinod scored less than Rahul but more than Gangan and Anand. Whose score was the lowest in the match?  
 (a) Rahul (b) Gangan (c) Anand (d) Either Gangan or Anand
15. Pointing to a man Sanjay said, "His son is my son's uncle." How is the man related to Sanjay?  
 (a) Father (b) Uncle (c) Brother (d) Grandfather
16. A is the father of C but C is not his son. E is the daughter of C. F is the spouse of A. B is the brother of C. D is the son of B. G is the spouse of B. H is the father of G. Who is the son of F?  
 (a) B (b) C (c) D (d) E
17. ' $P \times Q$ ' means 'P is the father of Q', ' $P - Q$ ' means 'P is the sister of Q', ' $P + Q$ ' means 'P is the mother of Q', ' $P \div Q$ ' means 'P is the brother of Q', Which of the following represents 'R' is the niece of M?  
 (a)  $M \div K \times T - R$  (b)  $M - J + R - N$  (c)  $R - M \times T \div W$  (d) Cannot be determined
18. A husband and wife had five married sons and each of them had four children. How many members are there in the family?  
 (a) 50 (b) 40 (c) 32 (d) 36
19. A policeman left his police post and proceeded 4km South on hearing a loud sound from point A. On reaching the place, he heard another sound and proceeded 4km to his left to the point B. From B, he proceeded left to reach another place C, 4km away. In which direction he has to go to reach his police post?  
 (a) North (b) South (c) East (d) West
20. If South-West becomes North, then what will North - East be?  
 (a) North (b) South-East (c) South (d) East
21. Remo walks 10 m in front and 10m to the right. Then, every time turning to his left, he walks 5, 15, and 15 m. respectively. How far is he now from his starting point?  
 (a) 15 m (b) 5 m (c) 10 m (d) 20 m
22. A, B, C and D are playing cards. A and B are partners. D faces towards North, If A faces towards West, then who faces South? A and B are partners.  
 (a) B (b) C (c) D (d) Data inadequate
23. Which of the following diagram correctly represents the relationship amongst Tiger, Elephant, Animal?



24. Which part of the following figure shows literate Males, who are doctors ?

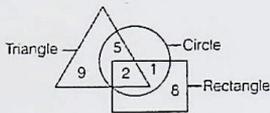


- (a) G (b) E (c) D (d) F

25. If 12% people in a village are suffering from cancer only and 13% from blood pressure, then which of the following diagram best represents the sick population of the village?

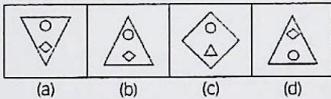
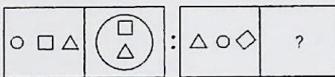


26. Find out the number, that lies inside all the figure?

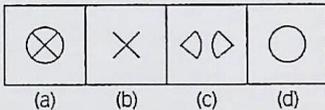
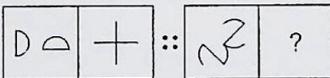


- (a) 2 (b) 5 (c) 9 (d) No such number is there

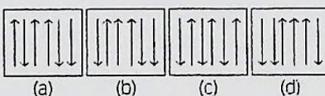
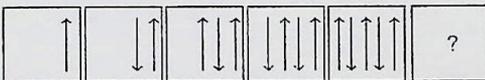
27. Complete the second pair in the same way as the first pair



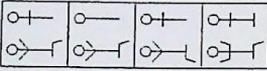
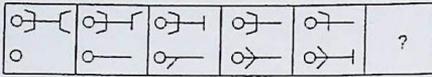
28. Complete the second pair in the same way as the first pair



29. Choose the figure which will complete the Series

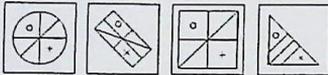


30. Choose the figure which will complete the Series



(a) (b) (c) (d)

31. Choose the figure which is different from others.



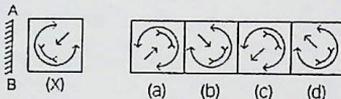
(a) (b) (c) (d)

32. Choose the figure which is different from others.



(a) (b) (c) (d)

33. Choose the correct mirror image of (X)

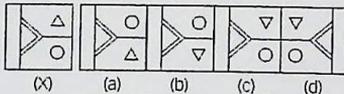


(a) (b) (c) (d)

34. Find the water image of ab45CD67

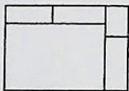
(a) aP12CD6Δ (b) 9P12CDEΔ (c) 9P12CDΔΔ (d) 9P12CD9Δ

35. Choose the correct water image of (X)



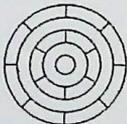
(a) (b) (c) (d)

36. How many rectangles are there in the question figure?



(a) 6 (b) 7 (c) 8 (d) 9

37. What is the minimum number of different colours required to paint the given figure such that no two adjacent regions have the same colour?



(a) 4 (b) 3 (c) 2 (d) 5

38. Which number is opposite to face 3



- (a) 1                      (b) 6                      (c) 5                      (d) 4

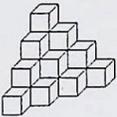
39. If the total number of dots on opposite faces of a die is 7. Find the correct figure among the following.



40. Three different positions of the same die are given. Choose the figure which will be formed when the cube is unfolded.



41. How many cubes are there in the ground?



1. 10                      (b) 16                      (c) 18                      (d) 20

42. Some statements and conclusions are given. Choose the conclusions which are logically follows from the given statements

**Statements :** All dogs are rats. All rats are crows, all crows are parrots

**Conclusions**

1. All dogs are parrots
2. Some parrots are dogs
3. Some crows are dogs
4. All rats are dogs

- (a) 1 and 2 follow (b) 1, 2 and 3 follow (c) Either 2 or 4 follows (d) Either 1 or 3 follows

43. Read the statements and choose the answer from the options

**Statements:** All the students in my class are bright. Manish is not bright.

**Conclusions**

1. Some students are not bright.
2. Manish must work hard.
3. Non-bright ones are not students.
4. Manish is not a student of my class

- (a) Only 1 follows (b) 2 and 3 follow (c) 3 and 1 follow (d) Only 4 follows

44. Determine which assumption is implicit in the given statement.

**Statement** It is dangerous to lean a moving train

**Assumptions**

1. All who lean out of a train take risk of being hurt.
2. Generally people don't like to get hurt.

- (a) Only 1            (b) Only 2            (c) Neither 1 nor 2            (d) Both 1 and 2

45. The diameters of base of two cones are equal. If their slant heights are in the ratio 5:4. Find the ratio of their curved surface areas.

- (a) 3 : 4.            (b) 5 : 3            (c) 5 : 4            (d) 4 : 5

46. If the sum of the lengths of the diagonals of a rhombus is 10 m and if its area is  $9\text{ m}^2$ , then what is the sum of the squares of the diagonals?

- (a)  $36\text{ m}^2$             (b)  $64\text{ m}^2$             (c)  $80\text{ m}^2$             (d)  $100\text{ m}^2$

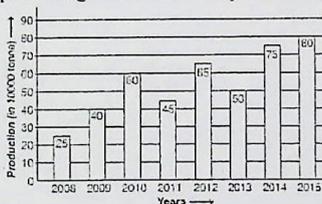
47. The sum of length, breadth and depth of a cuboid is 19 cm, and its diagonal is  $5\sqrt{5}$  cm. Its surface area would be

- (a)  $361\text{ cm}^2$             (b)  $125\text{ m}^2$             (c)  $236\text{ m}^2$             (d)  $486\text{ m}^2$

48. An angle that measures less than  $90^\circ$  is called

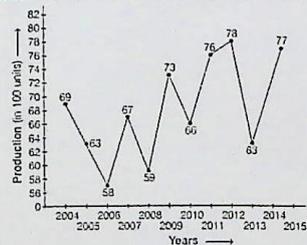
- (a) Acute angle            (b) Obtuse angle            (c) Right angle            (d) Straight angle

49. The bar chart of production of fertilizers by a company over the years is given. What was the percentage decline in the production of fertilizers from 2010 to 2011?



- (a)  $33\frac{1}{3}\%$             (b) 20%            (c) 25%            (d) 21%

50. The line graph for the production of colour television sets in various years is given. Find the difference between the maximum and minimum production



- (a) 2200            (b) 1900            (c) 2000            (d) 2900