JEE Main 2025 Paper 2A (B.Arch) Apr 9 Single sitting Question Paper

Conducted by the National Testing Agency (NTA)

Time Allowed: 3 Hours **B.Arch** **Maximum Marks: 400**

General Instructions

(i) This is **Paper 2A (B.Arch)** of **JEE (Main) 2025**, conducted by the National Testing Agency on **9 Apr 2025**.

(ii) The paper contains **77 questions**; attempt **77** as specified in the section table. The maximum score is **400 marks**.

(iii) Multiple choice questions have four options. Select one answer. Each correct answer carries **4 marks**; an incorrect answer carries **−1 mark**.

(iv) Numerical value questions carry **4 marks** for a correct answer and **−1 marks** for an incorrect answer. Unanswered questions carry **0 marks**.

(v) The Drawing section contains **two questions of 50 marks each**. Follow the alternatives and instructions printed within each question.

(vi) All questions are compulsory.

Section	Questions	To attempt	Marks
Mathematics Section A	20	20	80
Mathematics Section B	5	5	20
Aptitude Test	50	50	200
Drawing	2	2	100

Mathematics Section A

1. 4 marks

Let R be a relation on the set $A = \{1, 2, 3, 4, \ldots, 10\}$ given by xRy if and only if x divides y. Let m be the number of elements in R and n be the number of minimum elements required to be added in R to make it a symmetric relation. Then $m + n$ is equal to

(1) 16 (2) 32

(3) 36 (4) 44

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2. 4 marks

If the range of the function $f(x) = \sqrt{3-x} + \sqrt{5+x}$ is $[\alpha, \beta]$, then $\alpha^2 + \beta^2$ is equal to

(1) 18 (2) 20

(3) 24 (4) 25

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3. 4 marks

If the line $\arg(z) = \frac{\pi}{3}$ intersects the curve $\left|z - 2\sqrt{3}i\right| = 2$, $z \in \mathbb{C}$, at two distinct points A and B, then AB equals

(1) 1 (2) 2

(3) 4 (4) 6

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4. 4 marks

If the system of linear equations : $x + y + z = 4, x + 2y + 3z = 6, 4x + 5y + \lambda z = \mu$ has more than one solution, then the value of $\lambda + \mu$ is equal to

(1) 18 (2) 9

(3) 12 (4) 24

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5. 4 marks

Let $b_1 = 3, b_2, b_3, \ldots$ be a geometric progression of increasing positive numbers. Let $\sum_{n=1}^{20} b_{3n} = 4\sum_{n=1}^{20} b_{3n-2}$. Then, the sum of the first ten terms of the G. P. is

(1) 1023 (2) 2046

(3) 3069 (4) 3149

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6. 4 marks

If all the words, with or without meaning, made using all the letters of the word "RANCHI" are arranged as in a dictionary, then the word at 560^{th} position is :

(1) NICHRA
(2) NICAHR
(3) NICARH
(4) NICHAR

7. 4 marks

The number of integral terms in the binomial expansion of $\left(11^{\frac{1}{2}}+17^{\frac{1}{8}}\right)^{1024}$ is

(1) 129
(2) 131
(3) 133
(4) 137

8. 4 marks

Two persons A and B alternately throw a pair of dice. A wins if he throws a sum of 4 before B throws a sum of 9 and B wins if he throws a sum of 9 before A throws a sum of 4. The probability, that A wins if B makes the first throw, is

(1) $\frac{1}{5}$
(2) $\frac{2}{5}$
(3) $\frac{3}{5}$
(4) $\frac{4}{5}$

9. 4 marks

The mean and standard deviation of four numbers are given by 10 and $\frac{5\sqrt{2}}{2}$, respectively. If a fifth number 15 is added to the data set, then the variance of the new data set is

(1) 13.5
(2) 13
(3) 14.5
(4) 14

10. 4 marks

Let the distance between the foci of an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1\,(a>b)$ be 4 and the distance between its directrices be 10. Then the length of its latus rectum is :

(1) $\frac{12}{\sqrt{10}}$
(2) $\frac{6}{\sqrt{10}}$
(3) $\frac{8}{\sqrt{5}}$
(4) $\sqrt{10}$

11. 4 marks

Let e_1 and e_2 be the eccentricities of the ellipse $2x^2 + 9y^2 = 36$ and the hyperbola $4x^2 - 9y^2 = 36$, respectively. Then the distance between the point of intersection of the lines $5x - 7y = 3$ and $3x + y = 7$, and the point $\left(9e_1^2, 9e_2^2\right)$ is

(1) 11 (2) 12

(3) 13 (4) 15

12. 4 marks

Let $A(3, 4)$, $B(5, -2)$ and $P(\alpha, \beta)$, $\alpha\beta \neq 0$, be three point such that $PA = PB$ and the area of ΔPAB is 10. Then the distance of the point $Q(2\alpha - 5\beta, \alpha - \beta^2)$, from the line having intercepts 3 and 1 on x- and y- axis respectively, is

(1) 10 (2) $\sqrt{10}$

(3) 15 (4) 2

13. 4 marks

The number of integral values of n, for which the equation $3\cos x + 5\sin x = 2n + 1$ has a solution, is

(1) 4 (2) 6

(3) 8 (4) 10

14. 4 marks

Let the points $A(a, -1, 2)$, $B(1, b, -4)$, $C(-1, 1, c)$ and $D(1, -2, 8)$ be the vertices of a parallelogram ABCD. Then its area is equal to

(1) $2\sqrt{73}$ (2) $2\sqrt{51}$

(3) 28 (4) 14

15. 4 marks

Let (α, β, γ) be the foot of the perpendicular from the point $(25, 2, 41)$ on the line $\frac{x-4}{3} = \frac{y+1}{7} = \frac{z-2}{3}$. Then $\alpha + \beta + \gamma$ is equal to

(1) 41 (2) 42

(3) 44 (4) 45

16. 4 marks

Consider a sphere of volume 36π. Then the height, of the cone of maximum volume that can be inscribed in the sphere, is

(1) 1 (2) 4

(3) $\sqrt{3}$ (4) $2\sqrt{3}$

17. 4 marks

If $f(x)=\begin{vmatrix} -\cos x & \tan x & 3\sin x \\ 1 & -3x & 2x^2 \\ x^3 & x & x^2 \end{vmatrix}$, then the value of $\lim\limits_{x\to 0}\dfrac{(1+x)f(x)-3x\sin x}{x^3}$ is

(1) 3
(2) 5
(3) 7
(4) 8

18. 4 marks

The area of the region

$\left\{(x, y): \sin x \le y \le \sqrt{\pi^2 - x^2}\right\}$ is:

(1) π^3
(2) $\dfrac{\pi^3}{2}$
(3) $\dfrac{\pi^3}{4}$
(4) $\dfrac{\pi^3}{8}$

19. 4 marks

Let $f(x)=\begin{cases} 3x, & x<0 \\ 1+x+[x], & 0\le x\le 2 \\ 5, & x>2 \end{cases}$, where $[x]$ denotes the greatest integer function. If α and β are the number of points in $\mathbb{R}$, where f is not continuous and is not differentiable, then α + β equals

(1) 3
(2) 4
(3) 5
(4) 6

20. 4 marks

Let $f(x)=\int\left(\dfrac{1}{\log_e x}-\dfrac{2}{(\log_e x)^3}\right)dx$. If $f(e) = 2e$, then $f(e^2)$ is equal to

(1) $\dfrac{e^2}{4}$
(2) $\dfrac{e^2}{2}$
(3) $\dfrac{3e^2}{4}$
(4) $\dfrac{4e^2}{3}$

Mathematics Section B

21. Numerical value · 4 marks

Let the value of p, such that the sum of the squares of the roots of the quadratic equation $x^2 + (7-p)x + 4 = p$ has least value, be α and the corresponding roots be β and γ. Then $\alpha^3 + \beta^3 + \gamma^3$ equals _____.

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22. Numerical value · 4 marks

Let $25^x + 25^{-x}, \frac{\alpha}{3}, 20^{1+x} + 20^{1-x}, x, \alpha \in \mathbb{R}$ be the first three terms of an A.P. of increasing terms. For the least value of α, the sum of its first 10 terms is _____.

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23. Numerical value · 4 marks

If the circles $x^2 + y^2 - 2x - 8y + 17 = r$ and $x^2 + y^2 - 26x - 18y + 234 = 0$ intersect at exactly one point, then the sum of all possible values of r is _____.

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24. Numerical value · 4 marks

Let $\vec{a} = 2\hat{i} + 3\hat{j} + 5\hat{k}$, $\vec{b} = \hat{i} - \hat{j} + 3\hat{k}$ and $\vec{c}$ be a vector such that $\vec{a} \cdot \vec{c} = 104$ and $\vec{a} \times \vec{c} = \vec{c} \times \vec{b}$. Then $\vec{b} \cdot \vec{c}$ is equal to _____.

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25. Numerical value · 4 marks

Let $y = y(x)$ be the solution of the differential equation $x\frac{dy}{dx} + y + xy\cot x = x, \frac{\pi}{4} \le x \le \frac{3\pi}{4}$, $y\left(\frac{\pi}{4}\right) = 0$. Then $6y\left(\frac{3\pi}{4}\right)$ equals _____.

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26. 4 marks

The concept of scale in architecture is more clearly associated with:

(1) The durability of materials

(2) The relative size of elements compared to human dimensions.

(3) The energy efficiency of the building.

(4) The colour scheme of the façade

27. 4 marks

BRICK :MASONRY : : TILES : _____

(1) Carpentry

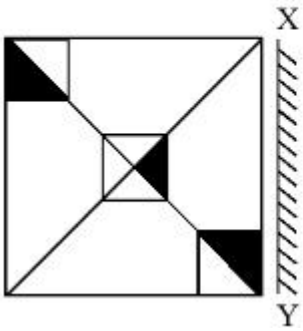
(2) Wiring

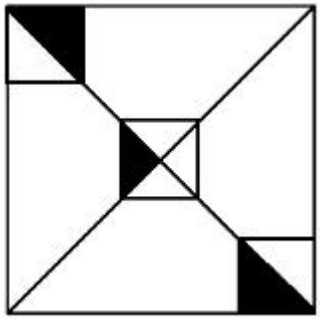
(3) Plumbing

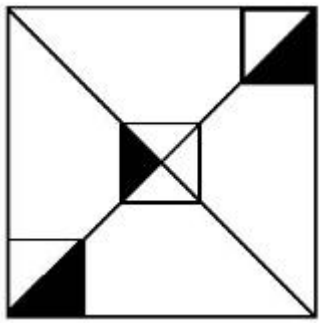
(4) Flooring

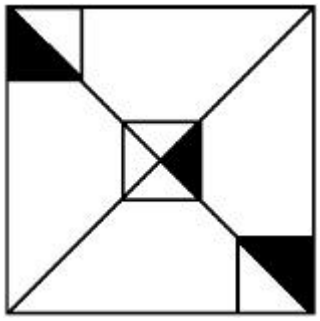
28. 4 marks

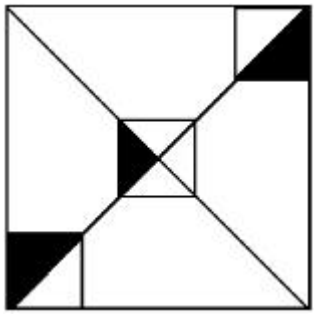
Identify the correct mirror image of the given figure along XY-axis.



(1) 

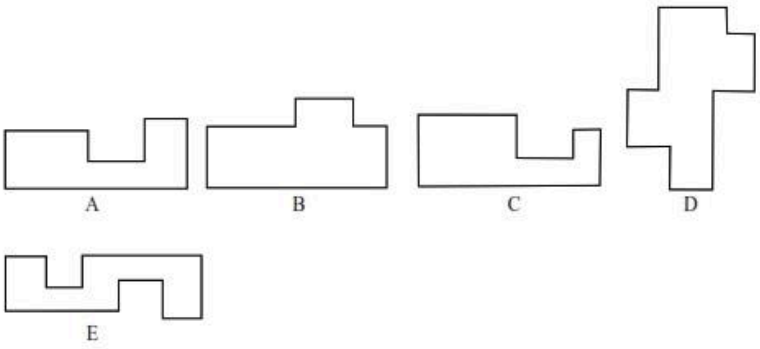
(2) 

(3) 

(4) 

29. 4 marks

Five diagrams A, B, C, D, E are given. Three out of these when put together form a square. Find out the diagrams.



Choose the correct answer from the options given below:

(1) A, C, D
(2) B, C, D
(3) A, B, C
(4) C, D, E

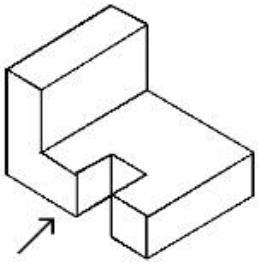
30. 4 marks

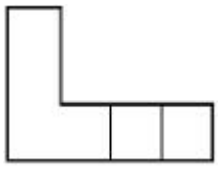
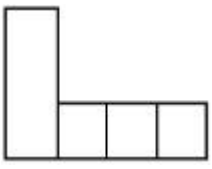
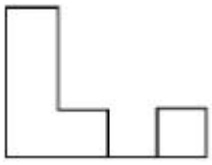
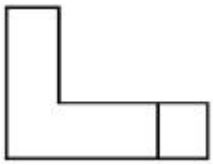
A man is looking at a photograph of a woman and his friend asked him "Who is she?" Then the man replied "I have no brother and sister, but the father of the woman in the photograph is my father's son". Who is the woman in the photograph?

(1) His daughter
(2) His wife
(3) His sister
(4) His mother

31. 4 marks

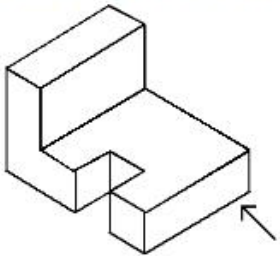
The question figure shows the 3D view of an object. Identify the correct view looking in the direction of the arrow.



(1) 
(2) 
(3) 
(4) 

32. 4 marks

The question figure shows the 3D view of an object. Identify the correct view looking in the direction of the arrow.



(1) 

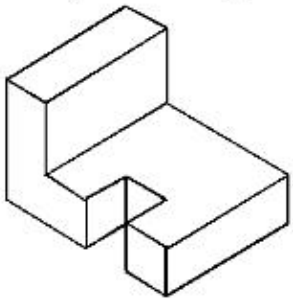
(2) 

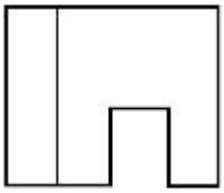
(3) 

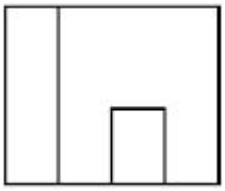
(4) 

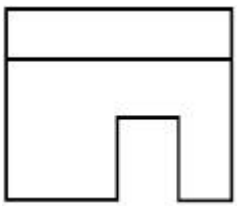
33. 4 marks

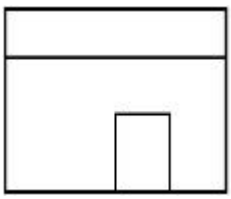
The question figure shows the 3D view of an object. Identify the correct top view .



(1) 

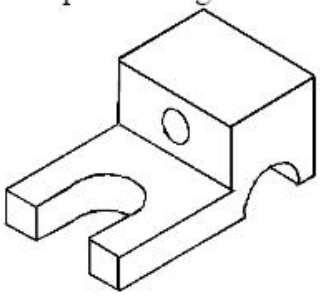
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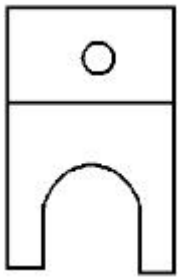
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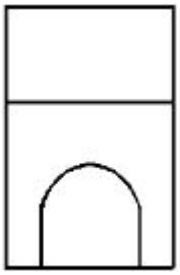
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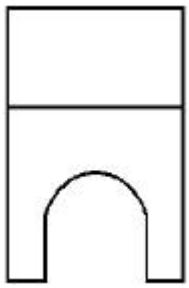
34. 4 marks

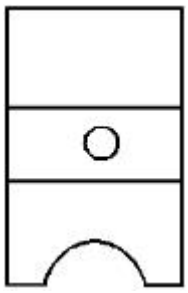
The question figure shows the 3D view of an object. Identify the correct top view of the object.



(1) 

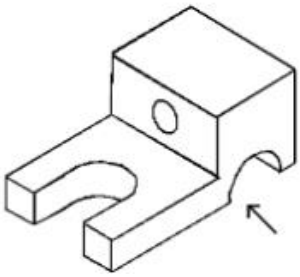
(2) 

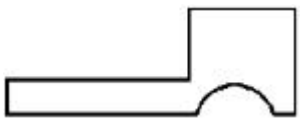
(3) 

(4) 

35. 4 marks

The question figure shows the 3D view of an object. Identify the correct view looking in the direction of the arrow.



(1) 

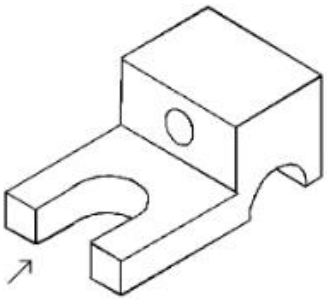
(2) 

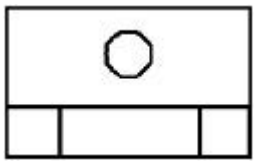
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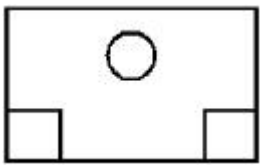
(4) 

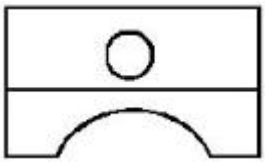
36. 4 marks

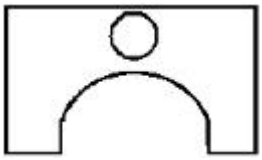
The question figure shows the 3D view of an object. Identify the correct view looking in the direction of arrow.



(1) 

(2) 

(3) 

(4) 

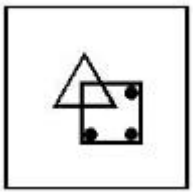
37. 4 marks

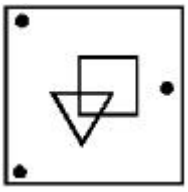
A man walks 10 km north, then turns to his left and walks 5 km, then turns to his left again and walks 10 km. How far is he from his starting point?

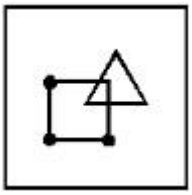
(1) 10 km
(2) 20 km
(3) 15 km
(4) 5 km

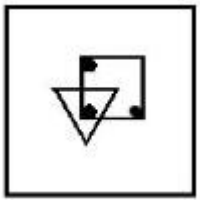
38. 4 marks

Identify the figure which is odd from rest of the figures.

(1) 

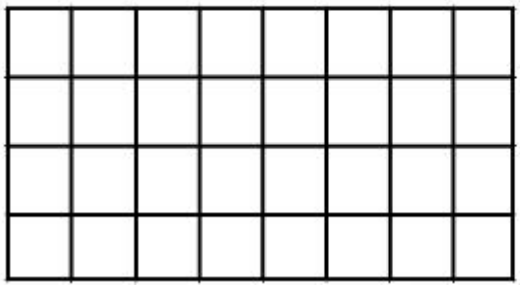
(2) 

(3) 

(4) 

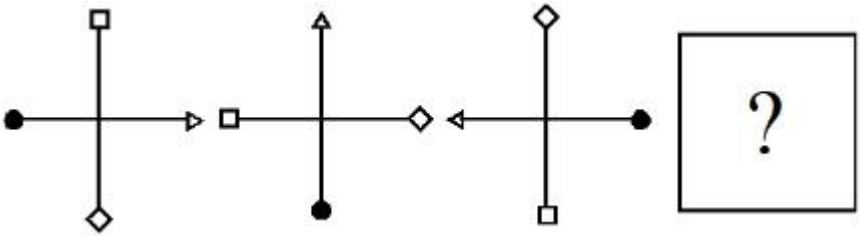
39. 4 marks

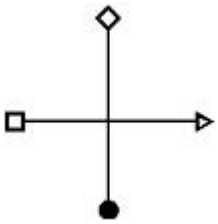
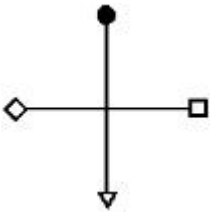
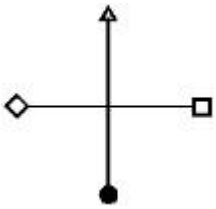
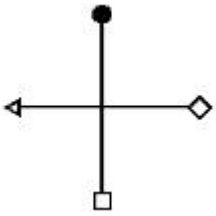
How many squares are there in the given figure?



(1) 32
(2) 48
(3) 78
(4) 70

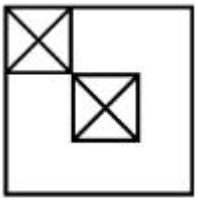
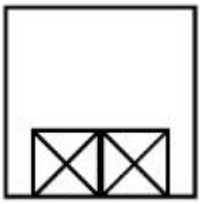
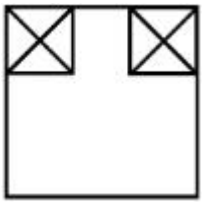
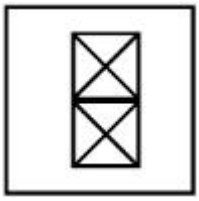
40. 4 marks



(1) 
(2) 
(3) 
(4) 

41. 4 marks

Find the odd one when the object is divided vertically through the centre.

(1) 
(2) 
(3) 
(4) 

42. 4 marks

A man is facing East, turns 90° clockwise, then 180° anti clockwise, and then another 90° clockwise. In which direction is he facing?

(1) West
(2) East
(3) North
(4) South

43. 4 marks

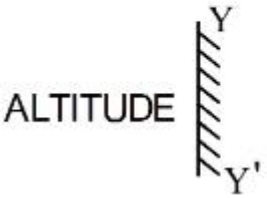
What is the mirror image of PRODUCTION along X-X' axis.



(1) ꓤЯODUCTIOИ
(2) ꟼЯODUCTIOИ
(3) ꟼЯODUCTIOИ
(4) ꟼЯODUCTIOИ

44. 4 marks

Identify the mirror image of given word ALTITUDE along Y-Y' axis.

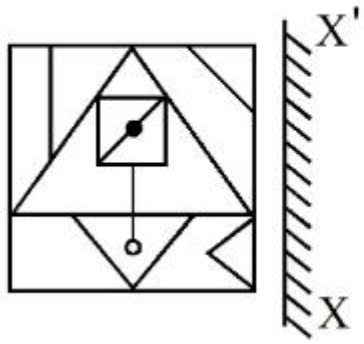


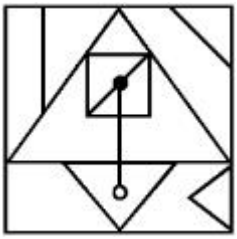
(1) ƎDUTITꓕA
(2) ƎDUTITꓕA
(3) ƎDUTITꓶA
(4) ∀LTITUDE

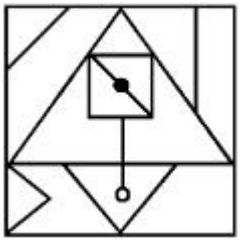
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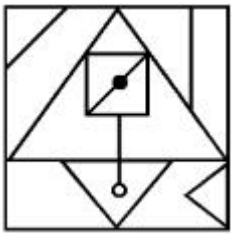
45. 4 marks

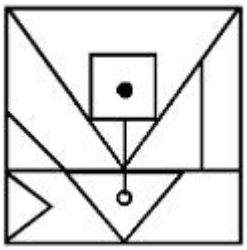
Identify the correct mirror image of given figure along XX'-axis.



(1) 

(2) 

(3) 

(4) 

46. 4 marks

Identify the most used building material seen in the facade of the building.



(1) Sand Stone

(2) Granite

(3) Marble

(4) Slate

47. 4 marks

Identify the name of the monument.



(1) Tower of Victory
(2) Connaught Place
(3) The Pantheon
(4) The Parthenon

48. 4 marks

Which book by Robert Venturi is considered as pivoted text in the development of post modern architecture?

(1) The timeless way of building
(2) The poetics of space
(3) Complexity and contradiction in architecture
(4) Architecture : Form, Space and Order

49. 4 marks

Which material is used traditionally to make Sandpaper?

(1) Brick
(2) Silica
(3) Iron
(4) Rubber

50. 4 marks

The 'Sagrada Familia' in Barcelona, a masterpiece of unique design and organic forms, was designed by:

(1) Antoni Gaudi
(2) Santiago Calatrava
(3) Renzo Piano
(4) Zaha Hadid

51. 4 marks

Pointed arches and flying buttresses were the prominent architectural style introduced in:

(1) Romanesque
(2) Renaissance
(3) Gothic
(4) Baroque

52. 4 marks

"Acoustical Design" deals with:

(1) Structure of building
(2) Sound in the building
(3) Ventilation of the building
(4) Facade design

53. 4 marks

What is the primary purpose of using a 'mullion' in window design?

(1) For decoration
(2) To enhance ventilation
(3) To support the glass within the window frame
(4) To block sunlight

54. 4 marks

The usable area of floor is called:

(1) Carpet area
(2) Plinth area
(3) Surface area
(4) Built-up area

55. 4 marks

Name the place where 'Statue of Unity' is situated.

(1) Gandhinagar, Gujarat
(2) Kadi, Gujarat
(3) Anand, Guajarat
(4) Kewadia, Gujarat

56. 4 marks

What is the proportional relationship in classical architecture, represented as 1.628?

(1) Fibonacci sequence
(2) Symmetry ratio
(3) Golden ratio
(4) Modular scale

57. 4 marks

Rings of the wooden log represents:

(1) Strength of wood
(2) Age of the wood
(3) Colour of wood
(4) Defects of wood

58. 4 marks

Which ancient civilization is credited with inventing the arch, a fundamental structural element in architecture?

(1) Greek
(2) Roman
(3) Egyptian
(4) Mesopotamian

59. 4 marks

Which architectural structure in Paris is known for its iconic wrought iron lattice work and was completed in 1889?

(1) Notre Dame Cathedral
(2) Louvre Museum
(3) Eiffel Tower
(4) Arc de Triumph

60. 4 marks

'Char bagh' concept is an important characteristic of which Garden style?

(1) Chinese Garden
(2) Mughal Garden
(3) Japanese Garden
(4) French Garden

61. 4 marks

If a room is painted with dark colour, what will be the appearence of the room?

(1) Room will appear smaller than the original room size
(2) Room will appear larger then the original room size
(3) Room will look brighter and appear larger than the original size.
(4) Room will look brighter

62. 4 marks

The ground floor plan of a building has 3 entrances. If each entrance can be connected by stairs or an elevator externally, in how many ways can a person enters the building through the entrance?

(1) 03
(2) 06
(3) 09
(4) 12

63. 4 marks

Given below are two statements:

Statement I: The concept of "form follows function" suggest that a building's design should primarily consider its use.

Statement II: The concept of "form follows functions" means that aesthetics should take precedence over functionality.

In the light above statements, choose the ***correct*** answer from the options given below

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

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64. 4 marks

Given below are two statements:

Statement I: The sun has a maximum altitude of 90° on Tropic of Capricorn on 22nd June at 12 noon and gradually decreases thereafter till 22nd December.

Statement II: The tilt of earth on axis of 23.5° has no role to play in the change of altitude of sun on Tropic of Capricorn.

In the light above statements, choose the ***correct*** answer from the options given below

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

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65. 4 marks

Given below are two statements:

Statement I: 'Granite' is the hardest stone.

Statement II: 'Marble' is a soft stone.

In the light above statements, choose the ***correct*** answer from the options given below

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

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66. 4 marks

Given below are two statements:

Statement I : "Wind speed" should be considered while designing tall buildings.

Statement II : "Buildings" should be rigid in an earthquake high risk zone.

In the light of above statements, choose the ***correct*** answer from the options given below

(1) Both Statement I and Statement II are true
(2) Both Statement I and Statement II are false
(3) Statement I is true but Statement II is false
(4) Statement I is false but Statement II is true

---

67. 4 marks

Match the **LIST-I** with **LIST-II**

	LIST-I (Building)		**LIST-II (Shape)**
A.	Sanchi Stupa	I.	Cylinder
B.	Circular Column	II.	Triangular Surfaces
C.	Pyramid	III.	Dome
D.	Palaces	IV.	Cuboids

Choose the ***correct*** answer from the options given below:

(1) A-IV, B-III, C-I, D-II

(2) A-III, B-I, C-II, D-IV

(3) A-I, B-IV, C-III, D-II

(4) A-II, B-III, C-IV, D-I

68. 4 marks

Match the **LIST-I** with **LIST-II**

	LIST-I		**LIST-II**
A.	Column and Beam	I.	Aesthetics
B.	Trees and Plants	II.	Services
C.	Building form	III.	Landscape
D.	Water supply	IV.	Structures

Choose the ***correct*** answer from the options given below:

(1) A-II, B-IV, C-III, D-I

(2) A-IV, B-III, C-I, D-II

(3) A-III, B-IV, C-I, D-II

(4) A-I, B-III, C-II, D-IV

69. 4 marks

Match the **LIST-I** with **LIST-II**

LIST-I		LIST-II	
A.	Sun Temple	I.	Tirupati
B.	Shiva Temple	II.	Pushkar
C.	Balaji Temple	III.	Modhera
D.	Brahma Temple	IV.	Ujjain

Choose the ***correct*** answer from the options given below:

(1) A-III, B-IV, C-I, D-II

(2) A-IV, B-I, C-III, D-II

(3) A-II, B-IV, C-I, D-III

(4) A-I, B-III, C-IV, D-II

70. 4 marks

Match the **LIST-I** with **LIST-II**

LIST-I (Construction equipments)		LIST-II (Functions)	
A.	Buldozer	I.	Used for transporting smaller loads over short distances at site.
B.	Crane	II.	Mixes cement, sand and aggregate with water to produce concrete.
C.	Concrete Mixer	III.	Used to transport concrete to different location at site.
D.	Wheel Barrow	IV.	Used to level and move debris from the site.

Choose the ***correct*** answer from the options given below:

(1) A-II, B-III, C-I, D-IV

(2) A-III, B-II, C-I, D-IV

(3) A-I, B-III, C-IV, D-II

(4) A-IV, B-III, C-II, D-I

71. 4 marks

'SDG' stands for:

(1) Sequential Design Goals

(2) Systematic Development Goals

(3) Strategic Development Goals

(4) Sustainable Development Goals

72. 4 marks

GRIHA stands for:

(1) Green Rating for Integrated Habitat Assessment

(2) Glare Rating for Integrated Heat Assessment

(3) Green Rating for Insulation Heat Assessment

(4) Glare Rating for Insulation Heat Assessment

73. 4 marks

ECBC stands for:

(1) Electricity Conservation Building Code

(2) Electricity Consumption Building Code

(3) Energy Conversion Building Code

(4) Energy Conservation Building Code

74. 4 marks

'HRIDAY' stands for:

(1) Heritage City in Developed Association Yojana

(2) High Residential in Densified Augmented Yojana

(3) Heritage City Development and Augmentation Yojana

(4) Hermitage Centre of Development and Association Yojana

75. 4 marks

What is the architectural term for a semi circular or polygonal recess, often found at the end of a church nave?

(1) Atrium

(2) Apse

(3) Cloister

(4) Ambulatory

Drawing

76. 50 marks

Using black and white medium only, draw a proportionate sketch of the image given below in detail with proper light and Shade.



77. 50 marks

Sketch a unique treehouse that reconnects with nature. Include features such as wooden decks, ladder using natural materials. The structure should blend harmoniously with the surrounding. Depict natural light, shadow and textures effectively. Colour it as per your choice.

OR

Visualize a vibrant street food festival set in an urban environment. Consider street food stalls, chefs preparing dishes, people standing in line and a variety of cuisines. Include street decorations and seating arrangements capturing the lively and diverse scene. Use suitable colours of your choice.