

JEE Advanced 2024 AAT Question Paper with Solutions

Time Allowed :3 hours	Maximum Marks :300	Total Questions :30
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General Instructions

Read the following instructions very carefully and strictly follow them :

- (1) The JEE Advanced 2024, AAT Paper , will be structured with a total of 300 marks over 3 hours.
- (2) Test will include 30 questions, will be segmented into five sections: Each Sections Carry 60 marks.
- (3) Answers are to be written only in the booklet and within the space provided beside / box provided beside/below each Question and nowhere else.
- (4) Answers written in non-designated place will not be evaluated.
- (5) Blank spaces are provided within this booklet for rough work.
- (6) Do not deface this booklet or detach or mutilate any sheet from the booklet. Such acts lead to disqualification.
- (7) There are no negative marking.
- (8) All the questions are compulsory.

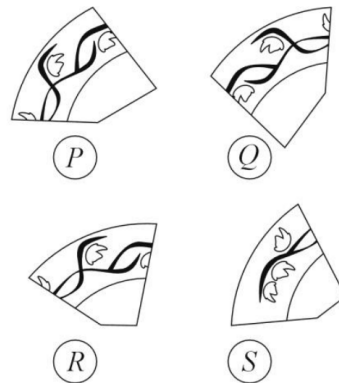
SECTION A

Q.1. This section contains 15 multiple choice questions. Each question has four options, out of which **ONLY ONE** is correct. Mark the correct option with a tick mark.

(i). A dinner plate was broken into six pieces. Five of the pieces are indicated in Figure A. Find out the missing piece from the options given below.



Figure A



- (A) *P*
- (B) *Q*
- (C) *R*
- (D) *S*

Correct Answer: (C) *R*

Solution: Step 1: Observe the pattern and alignment of the broken pieces in Figure A. Five of the six pieces are already placed.

Step 2: Compare each of the given options (*P*, *Q*, *R*, *S*) to the missing section. The missing piece should align with the curve and design of the plate.

Step 3: The piece labeled *R* matches the missing segment in both shape and pattern.

Thus, the correct answer is option C (*R*).

Quick Tip

When solving visual pattern puzzles, focus on the edges, curvature, and design elements. Rotating the given options mentally can help find the correct fit.

(ii). With respect to 'Green Buildings', consider the following statements and select the appropriate option.

1. The building materials are environmentally sustainable.
2. The building consumes less water and energy.
3. The building is designed with more greenery.
4. The building is coloured green, it being a nature-like colour.

- (A) Only 1 is correct
(B) Only 1 and 2 are correct
(C) 1, 2, and 3 are correct
(D) Only 3 and 4 are correct

Correct Answer: (C) 1, 2, and 3 are correct

Solution:

Step 1: Understanding the concept of 'Green Buildings'.

The following aspects define green buildings:

- Green buildings prioritize environmentally sustainable materials, making Statement 1 correct.
- They also focus on water and energy efficiency, making Statement 2 correct.
- Green buildings often incorporate more greenery, making Statement 3 correct.

Step 2: Evaluating Statement 4.

- A 'Green Building' does not necessarily mean the building is painted green. The term refers to sustainability and efficiency rather than color.
- Hence, Statement 4 is incorrect.

Thus, the correct answer is option C (1, 2, and 3 are correct).

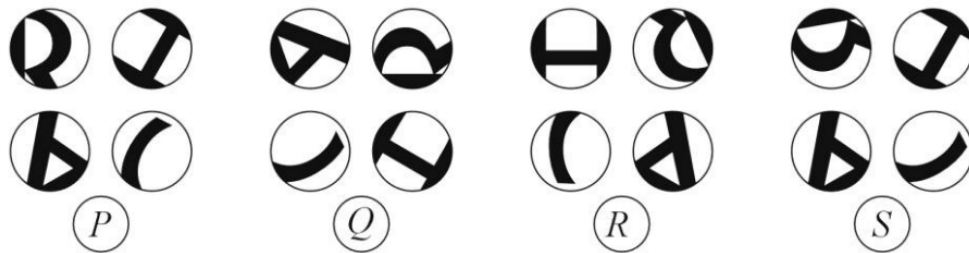
Quick Tip

Green buildings focus on sustainability, energy efficiency, and eco-friendly materials rather than just aesthetics. Always check for misconceptions in definitions.

(iii) Four circular cutouts have been made in the text in Figure B. Identify the option with the group of those four cutouts.



Figure B



- (A) P
- (B) Q
- (C) R
- (D) S

Correct Answer: (C) R

Solution:

Step 1: Observing the cutout placement in Figure B.

- The letters in "ARCH" have four circular cutouts.
- Each cutout is taken from specific locations in the text.

Step 2: Matching the given options to the cutouts in Figure B.

- By carefully comparing the patterns, option R correctly corresponds to the four extracted cutouts.

Thus, the correct answer is option C (R).

Quick Tip

When solving visual pattern problems, focus on matching shapes and orientations carefully. Comparing individual segments can help identify the correct answer.

(iv) The mighty weight of a tree, supported through its trunk, is transferred to the ground by its roots. In the same way, the weight of a building is transferred to the ground through different components, i.e., beams, columns, etc. Identify the correct sequence of the components through which the weight of a building is transferred to the ground.

- (A) Beam → Slab → Column → Foundation
- (B) Slab → Foundation → Beam → Column
- (C) Slab → Beam → Column → Foundation
- (D) Column → Slab → Beam → Foundation

Correct Answer: (D) Column → Slab → Beam → Foundation

Solution:

Step 1: Understanding the load transfer mechanism in a building.

- The weight of a building is transferred through structural elements in a specific order.
- Columns support the slabs, which then transfer load to beams, which further distribute it to the foundation.

Step 2: Analyzing the options.

- The correct sequence follows the natural load transfer in structures:

Column → Slab → Beam → Foundation

Thus, the correct answer is option D.

Quick Tip

In structural engineering, load transfer follows a hierarchy: columns bear the weight of slabs, beams distribute loads, and the foundation ultimately supports everything.

(v) Which of the following materials, used in construction, is an industrial waste product?

- (A) Lime
- (B) Fly Ash
- (C) Sand
- (D) Brick

Correct Answer: (B) Fly Ash

Solution:

Step 1: Understanding industrial waste products in construction.

- Fly ash is a byproduct of coal combustion in thermal power plants and is commonly used in concrete to improve strength and durability.

Step 2: Analyzing the given options.

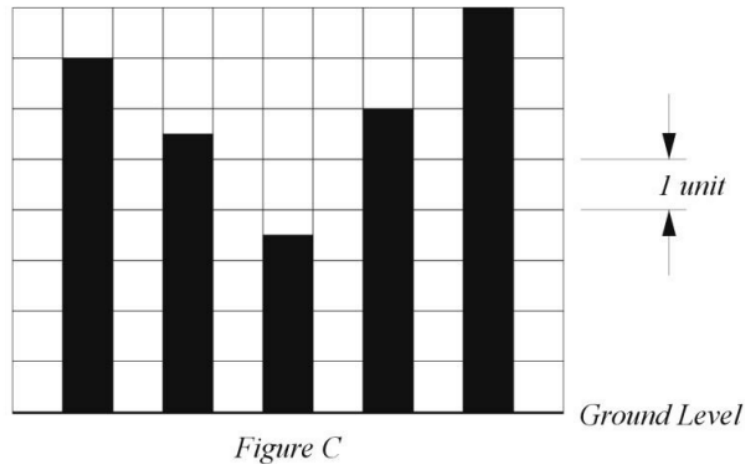
- Lime, sand, and bricks are naturally occurring or manufactured materials, not classified as industrial waste.

Thus, the correct answer is option B (Fly Ash).

Quick Tip

Fly ash is widely used in eco-friendly construction. It enhances the strength and sustainability of concrete, reducing environmental waste.

(vi) Five identical pillars, having equal height of 10 units and equal cross section, are inserted into the ground. Figure C shows only the portions of the pillars visible above ground. Which of the options given below indicates the ratio of the total volume of the pillars above and below the ground?



- (A) 3:2
- (B) 2:3
- (C) 1:1
- (D) 2:1

Correct Answer: (C) 1:1

Solution: Step 1: Understanding the pillar structure.

- Each pillar has a total height of 10 units.
- The visible portion above the ground is represented in Figure C.

Step 2: Calculating the ratio of volume above and below ground.

- Observing Figure C, we determine the average visible height of the pillars.
- Given equal cross-sections, volume is proportional to height.
- The total volume above ground is approximately equal to the volume below ground.

Thus, the correct ratio is 1:1, making option C correct.

Quick Tip

For ratio-based volume calculations, ensure the proportional relationship between height and volume, especially in uniform structures.

(vii) Consider a 3D hollow geometry with six faces and nine equal edges, as indicated in Figure D. Which of the given shapes will generate the described 3D geometry when folded along the dotted lines?

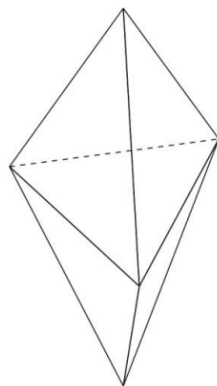
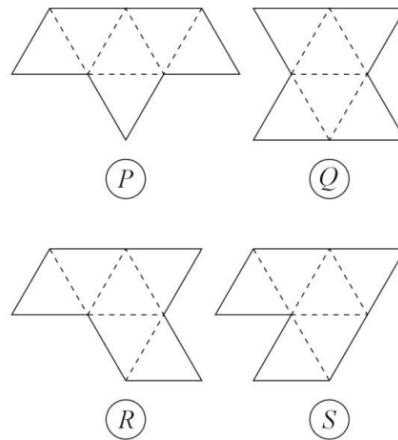


Figure D



- (A) Only P
- (B) Q and R
- (C) P , Q , and R
- (D) Only S

Correct Answer: (C) P , Q , and R

Solution:

Step 1: Understanding the given 3D structure in Figure D.

- The geometry consists of six triangular faces and nine equal edges.

Step 2: Identifying the correct net shapes.

- Shapes P , Q , and R , when folded along the dotted lines, correctly form the 3D structure.
- Shape S does not fold into the required 3D geometry.

Thus, the correct answer is option C (P , Q , and R).

Quick Tip

When solving 3D geometry problems, check for the number of faces and edges to determine which net folds correctly into the shape.

(viii) Considering the operation given in Figure E, what is the result of the operation in Figure F?



Figure E



Figure F

- (P) 6633
- (Q) 8888
- (R) 8322
- (S) 0880

- (A) P
- (B) Q
- (C) R
- (D) S

Correct Answer: (B) Q

Solution:

Step 1: Understanding the operation in Figure E.

- Observing the pattern of addition in Figure E.

Step 2: Applying the same operation to Figure F.

- Performing the operation to determine the missing result.

- The output corresponds to option Q.

Thus, the correct answer is option B (Q).

Quick Tip

When dealing with digital number patterns, observe how each digit changes rather than performing simple arithmetic.

(ix) Which of the following tasks is NOT a part of the job of an architect?

- (A) Design of buildings
- (B) Estimation of construction cost
- (C) Periodic site-supervision
- (D) Estimation of property taxes

Correct Answer: (D) Estimation of property taxes

Solution:

Step 1: Understanding the role of an architect.

- Architects design buildings and ensure structural integrity.
- They also supervise construction and estimate costs.

Step 2: Analyzing the given options.

- Property tax estimation falls under finance or taxation, not architecture.

Thus, the correct answer is option D.

Quick Tip

Architects focus on design, planning, and supervision, while property tax estimation is handled by financial professionals.

(x) You overheard a conversation between X and Y in a building. The conversations were as follows:

X: I am a part of a window and can be appreciated from outside.

Y: Well, I might be invisible, but I carry the building load.

X: While I ensure light inside the room, I am not affected by the weather.

Y: I am not exposed to the weather, and people take advantage of my strength, which you don't have much.

Identify X and Y from the options given below.

- (A) X is Glass and Y is Sand

- (B) X is Glass and Y is Reinforcement bar
- (C) X is Acrylic sheet and Y is Sand
- (D) X is Stone and Y is Reinforcement bar

Correct Answer: (B) X is Glass and Y is Reinforcement bar

Solution:

Step 1: Identifying materials based on the clues.

- Glass is used in windows and allows light to pass through.
- Reinforcement bars (steel bars) are strong and used in construction to bear loads.

Step 2: Matching the descriptions with the options.

- The description of X matches glass.
- The description of Y matches reinforcement bars.

Thus, the correct answer is option B.

Quick Tip

Materials like glass provide aesthetics and light, while reinforcement bars are critical for structural integrity.

(xi) A building designed by the famous Indian architect Raj Rewal was demolished in the year 2017, after much controversy. Identify the building from the given options.

- (A) Old Parliament House, New Delhi
- (B) Bharat Bhavan, Bhopal
- (C) Hall of Nations, Pragati Maidan, New Delhi
- (D) Vidhan Bhavan, Bhopal

Correct Answer: (C) Hall of Nations, Pragati Maidan, New Delhi

Solution:

Step 1: Identifying the building.

- The Hall of Nations was an iconic structure designed by Raj Rewal in Pragati Maidan, New Delhi.

- It was demolished in 2017, causing significant controversy in architectural circles.

Step 2: Analyzing the given options.

- The other buildings listed were not designed by Raj Rewal or were not demolished.

Thus, the correct answer is option C.

Quick Tip

The Hall of Nations was an important symbol of modern Indian architecture, known for its geometric design and innovative structural approach.

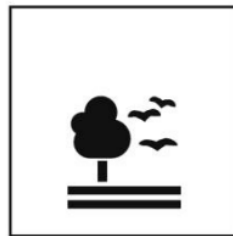
(xii) Which of the following graphics represents the United Nations' 'Sustainable Development Goal 3 (SDG 3): Good Health and Well-being'?



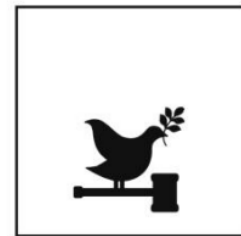
(P)



(Q)



(R)



(S)

(A) P

(B) Q

(C) R

(D) S

Correct Answer: (B) Q

Solution:

Step 1: Understanding the Sustainable Development Goals (SDGs).

- SDG 3 focuses on Good Health and Well-being, represented by a heartbeat or health-related icon.

Step 2: Analyzing the given options.

- The graphic labeled Q contains a heartbeat and heart symbol, which aligns with SDG 3.

Thus, the correct answer is option B (Q).

Quick Tip

The United Nations' SDG 3 emphasizes access to healthcare, reducing mortality rates, and promoting overall well-being.

(xiii) A hemispherical vessel of radius 30 cm is full of mixture to prepare kulfis. Kulfi-moulds are right circular cones of 5 cm diameter at base, having a height of 10 cm. Maximum how many kulfis can be prepared by filling the moulds up to the brim?

- (A) 432
- (B) 864
- (C) 536
- (D) 216

Correct Answer: (B) 864

Solution: Step 1: Calculating the volume of the hemispherical vessel. - The formula for the volume of a hemisphere is:

$$V = \frac{2}{3}\pi r^3$$

- Given $r = 30$ cm:

$$V = \frac{2}{3}\pi(30)^3 = \frac{2}{3}\pi(27000) = 18000\pi \text{ cm}^3$$

Step 2: Calculating the volume of one kulfi-mould. - The formula for the volume of a cone is:

$$V = \frac{1}{3}\pi r^2 h$$

- Given $r = \frac{5}{2} = 2.5$ cm and $h = 10$ cm:

$$V = \frac{1}{3}\pi(2.5)^2(10) = \frac{1}{3}\pi(6.25)(10) = \frac{62.5}{3}\pi \text{ cm}^3$$

Step 3: Finding the number of kulfis that can be made.

$$\frac{\text{Total Volume}}{\text{Volume of one kulfi}} = \frac{18000\pi}{\frac{62.5}{3}\pi}$$

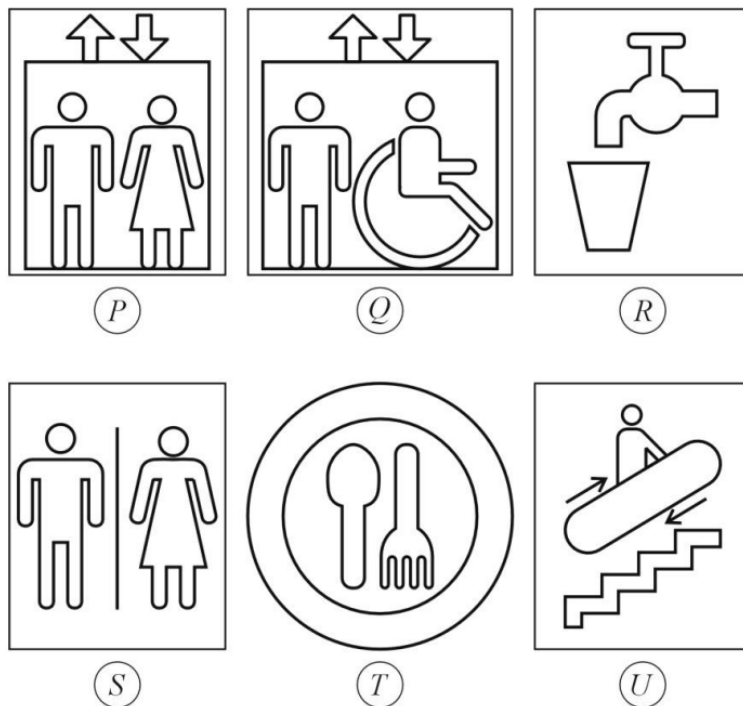
$$= \frac{18000 \times 3}{62.5} = \frac{54000}{62.5} = 864$$

Thus, the correct answer is option B (864).

Quick Tip

To compare volumes, always use the correct formulas and simplify calculations carefully to avoid errors.

(xiv) You have sprained your ankle and are on a wheelchair. You want to join your friends for a party at the food court located on the top floor of a shopping mall, which you are visiting for the first time. Since you are alone, and also do not know your way around, signs would help you. Which of the following signs will you require to conveniently reach your destination on your own?



- (A) Only *U* and *T*
- (B) *R*, *S*, and *T*
- (C) Only *Q* and *T*
- (D) Only *Q*

Correct Answer: (C) Only *Q* and *T*

Solution: Step 1: Identifying the relevant signs.

- Since you are on a wheelchair, you need an elevator with accessibility features (Sign *Q*).
- Since you are looking for the food court, a sign directing you to the dining area (Sign *T*) is necessary.

Step 2: Eliminating unnecessary signs.

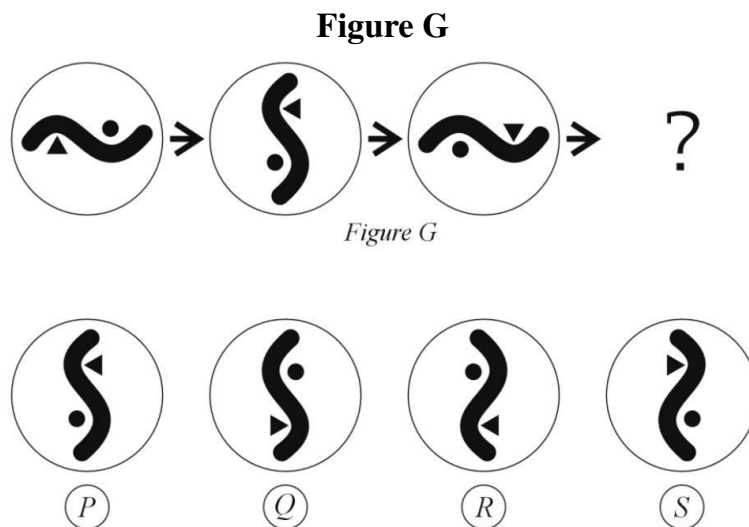
- *P* is a regular elevator sign but does not indicate wheelchair accessibility.
- *R* represents drinking water, which is not required for navigation.
- *S* indicates restrooms, which is not the primary need.
- *U* represents stairs, which are not suitable for a person in a wheelchair.

Thus, the correct answer is option C (*Q* and *T*).

Quick Tip

Accessibility features, such as wheelchair-friendly elevators and clear directional signs, are crucial for independent mobility in public places.

(xv) Identify the last figure in the sequence shown in Figure G.



(A) *P*

(B) *Q*

(C) *R*

(D) *S*

Correct Answer: (C) *R*

Solution: Step 1: Observing the pattern in Figure G.

- The given sequence alternates between two distinct shapes.
- Each shape undergoes a transformation that modifies its orientation and elements.

Step 2: Identifying the correct transformation.

- The first and third figures share similarities, and the second figure represents an intermediate transformation.
- Following this pattern, the missing figure should match the transformation pattern observed.

Step 3: Comparing with the given options.

- The correct answer follows the logical sequence and matches option *R*.

Thus, the correct answer is option C (*R*).

Quick Tip

When solving figure sequence problems, identify rotational patterns, symmetry, and element transformations carefully.

Q.2 Match the transport infrastructure described in Column I, with their names and locations in Column II.

Column I	Column II
(A) India's longest road bridge on sea <input type="checkbox"/>	(P) Atal Setu, Maharashtra
(B) India's longest road bridge on river <input type="checkbox"/>	(Q) Atal Bridge, Gujarat
(C) India's longest rail-cum-road bridge <input type="checkbox"/>	(R) Bogibeel Bridge, Assam
(D) India's highest rail bridge <input type="checkbox"/>	(S) Bhupen Hazarika Setu, Assam
(E) Pedestrian-only truss bridge <input type="checkbox"/>	(T) Chenab Bridge, Jammu & Kashmir
	(U) Worli Sea Link, Maharashtra

Correct Answer:

- (A) - (P) Atal Setu, Maharashtra
- (B) - (S) Bhupen Hazarika Setu, Assam
- (C) - (R) Bogibeel Bridge, Assam
- (D) - (T) Chenab Bridge, Jammu & Kashmir
- (E) - (Q) Atal Bridge, Gujarat

Solution:

Step 1: Identifying the transport infrastructure.

- Road bridges on sea and river vary based on location and span.
- Rail-cum-road bridges support both train and vehicle traffic.
- Highest rail bridges are constructed over deep valleys.
- Pedestrian truss bridges are lightweight structures designed for foot traffic.






Step 2: Matching infrastructure with locations.

- Atal Setu, Maharashtra is the longest road bridge on the sea.
- Bhupen Hazarika Setu, Assam is the longest road bridge on a river.
- Bogibeel Bridge, Assam is the longest rail-cum-road bridge.
- Chenab Bridge, Jammu & Kashmir is the highest rail bridge.
- Atal Bridge, Gujarat is a pedestrian-only truss bridge.

Quick Tip

When matching infrastructure names, consider the geographical features they span (sea, river, valley) and their structural functions.

Q.3 Match the representative skylines in Column I, with their corresponding cities in Column II.

Column I	Column II
(A) 	<input type="checkbox"/> (P) London
(B) 	<input type="checkbox"/> (Q) Paris
(C) 	<input type="checkbox"/> (R) Barcelona
(D) 	<input type="checkbox"/> (S) Venice
(E) 	<input type="checkbox"/> (T) Sydney
	(U) New York

Correct Answer:

- (A) - (R) Barcelona
- (B) - (P) London

- (C) - (U) New York
- (D) - (Q) Paris
- (E) - (T) Sydney

Solution:

Step 1: Identifying key landmarks in each skyline.

- Barcelona (A): Features Sagrada Familia.
- London (B): Recognizable by Tower Bridge and the London Eye.
- New York (C): Includes Statue of Liberty and skyscrapers.
- Paris (D): Dominated by the Eiffel Tower.
- Sydney (E): Distinct with the Sydney Opera House and Harbour Bridge.

Step 2: Matching skylines with corresponding cities.

- The architectural features are unique to each city, making identification straightforward.

Quick Tip

Recognizing global skylines requires identifying famous landmarks such as bridges, towers, and iconic buildings.

Q.4 Match the architectural landmarks of India in Column I, with their corresponding descriptions in Column II.

Column I	Column II
(A) Victoria Memorial Hall, Kolkata <input type="checkbox"/>	(P) Buddhist structure housing relics
(B) Dilwara Temple, Mount Abu <input type="checkbox"/>	(Q) Hindu temple with thousand pillared hall
(C) The Great Stupa, Sanchi <input type="checkbox"/>	(R) Colonial monument clad in marble
(D) Meenakshi Temple, Madurai <input type="checkbox"/>	(S) Jain temple with exquisite marble carvings
(E) Qutab Minar, Delhi <input type="checkbox"/>	(T) Mughal victory monument in sandstone
	(U) Sultanate brick tower clad in stone

Correct Answer:

- (A) - (R) Colonial monument clad in marble
- (B) - (S) Jain temple with exquisite marble carvings
- (C) - (P) Buddhist structure housing relics
- (D) - (Q) Hindu temple with thousand pillared hall
- (E) - (U) Sultanate brick tower clad in stone

Solution:

Step 1: Identifying architectural landmarks.

- Victoria Memorial Hall is a colonial-era structure clad in white marble.
- Dilwara Temple is a Jain temple with intricate marble carvings.
- The Great Stupa, Sanchi is a Buddhist structure used to house relics.
- Meenakshi Temple, Madurai is a Hindu temple known for its thousand-pillared hall.
- Qutab Minar, Delhi is a Sultanate-era brick tower with stone cladding.

Step 2: Matching descriptions with monuments.

- Each structure is unique in material, style, and historical significance, making their classification clear.

Quick Tip

When identifying architectural landmarks, consider their historical era, construction materials, and cultural significance.

SECTION B

Q.5 The front elevation of a city hoarding is shown in Figure H. Given below (Figure I) is the outline of the human-eye view of the hoarding.

Fill it up with text and graphic elements indicated in Figure H, maintaining geometry and proportion. Use the indicative grid provided.



Figure H

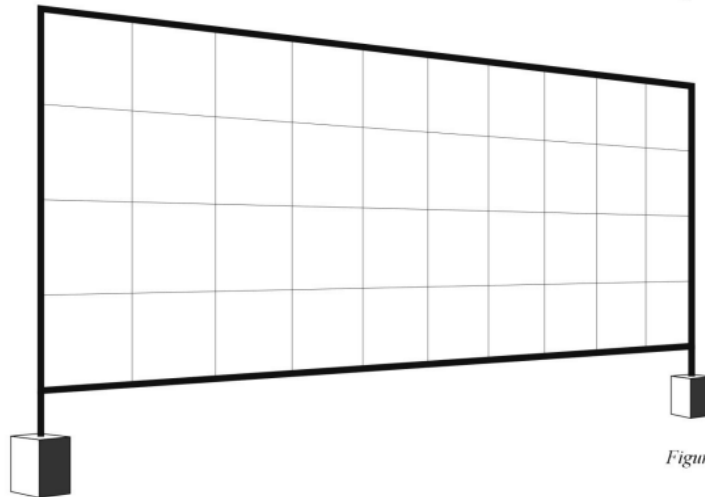


Figure I

Solution:

Step 1: Understanding the design elements.

- The hoarding in Figure H consists of:
- Bold typography (WELCOME 2024).
- Abstract curved graphics in the background.
- Grid alignment for structured proportions.

Step 2: Maintaining proportions and alignment.

- Use the grid as a reference to correctly place text and graphics.

- Ensure that the perspective view (Figure I) reflects distortions correctly.

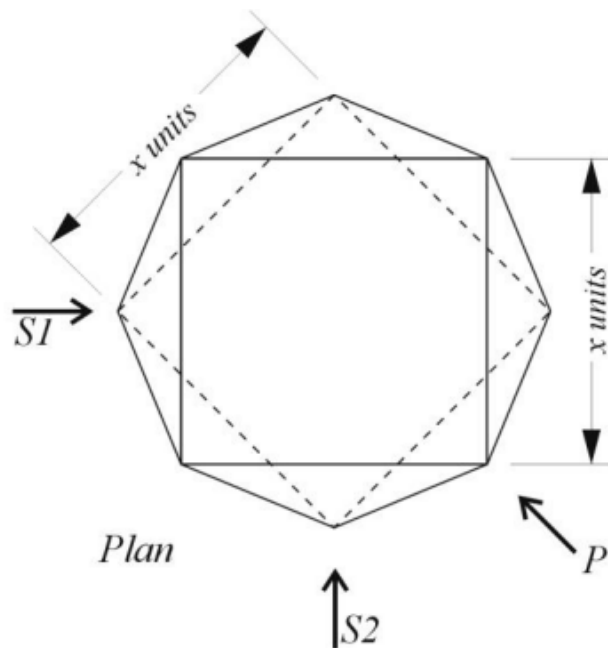
Step 3: Completing the design.

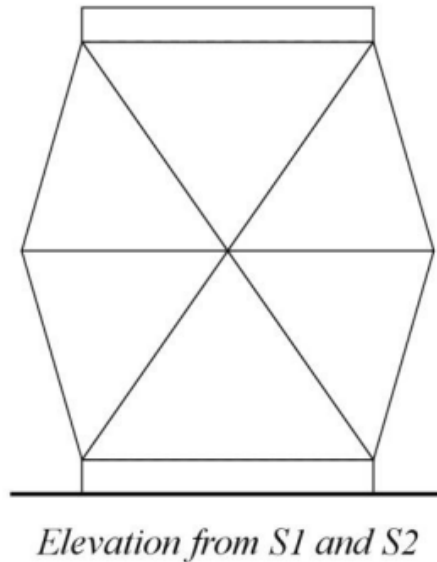
- Sketch the curved elements first, maintaining their alignment.
- Add the text (WELCOME 2024) with correct scaling.
- Use shading or hatching to depict dark and light zones.

Quick Tip

When transferring designs to perspective views, align key elements with the grid to maintain accurate proportions and distortions.

Q.6 A table lamp designed with simple geometrical forms is shown below in plan, and elevations from S1 and S2. Draw the elevation of the same lamp from the direction P, as indicated in the plan.





Solution:

Step 1: Understanding the provided views.

- The plan view (top-down) shows a hexagonal structure.
- The elevation from S1 and S2 suggests a symmetrical geometric design.

Step 2: Interpreting the elevation from direction P.

- The view from P will retain the geometric symmetry of the lamp.
- The hexagonal base and top faces will appear as edges in elevation.
- The triangular side elements will maintain the structural pattern.

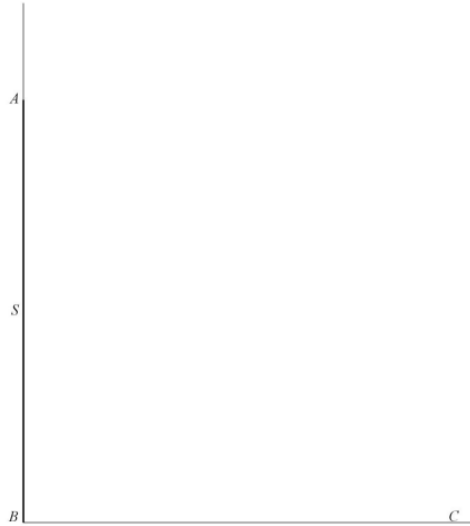
Step 3: Sketching the elevation from P.

- Project edges from the plan to establish proportions.
- Maintain symmetry and construction lines.
- Apply hatching or shading for a 3D effect.

Quick Tip

When drawing elevations from different directions, project key points from the plan and previous elevations to maintain accuracy.

Q.7 A rod AB of length 8 units, having mid-point at S, is in a vertical position as shown below. The end A is sliding vertically down, while end B is moving horizontally to your right till it reaches the point C, which is 8 units from the point B. Draw the locus of the mid-point S, using a minimum of 8 positions of AB.



Solution:

Step 1: Understanding the motion of the rod.

- Point A moves vertically downward while point B moves horizontally right.
- The rod maintains a constant length of 8 units.

Step 2: Finding the locus of midpoint S.

- The midpoint S of the rod will trace a quarter-circle path due to the simultaneous vertical and horizontal movements.

Step 3: Drawing at least 8 positions of the rod.

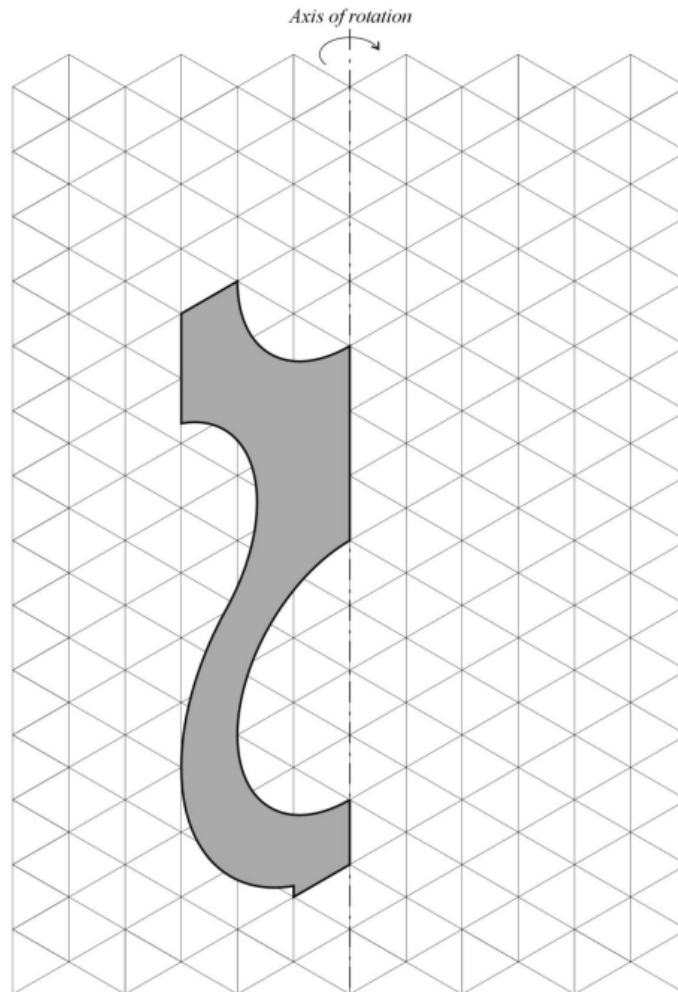
- Mark 8 different positions of the rod along its movement.
- Identify the corresponding midpoints S in each case.
- Connect these midpoints smoothly to illustrate the locus of S.

Quick Tip

When a rigid rod moves with one end sliding vertically and the other horizontally, its midpoint follows a circular arc. Use trigonometric or geometric methods to accurately determine intermediate positions.

SECTION C

Q.8 The shaded plane given below is rotated clockwise around the given axis, up to an angle of 270 degrees. Draw the solid form resulting from this rotation.



Solution:

Step 1: Understanding rotational solids.

- When a 2D shape rotates around an axis, it forms a 3D solid of revolution.
- The given shape will sweep through 270 degrees, forming a partially complete solid.

Step 2: Constructing the final solid.

- The outline of the solid can be determined by tracing the shape as it rotates.
- Identify key curvature points, edges, and symmetry.
- The final form will resemble a sculpted 3D volume, depending on the initial cross-section.

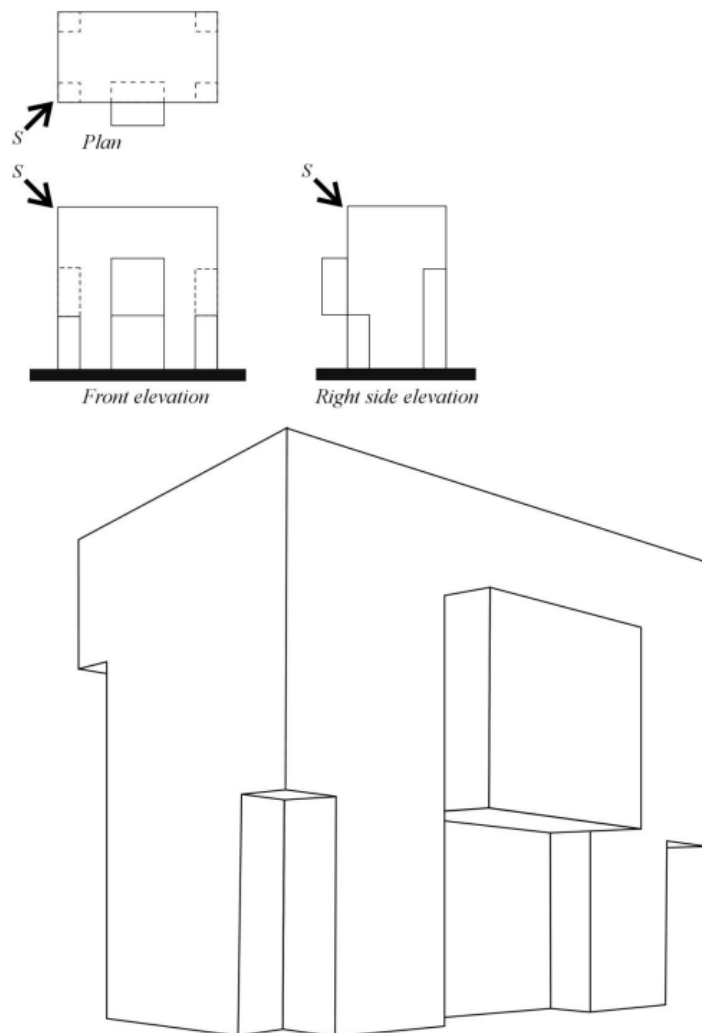
Step 3: Representing the solid on an isometric grid.

- Use the isometric grid for accurate proportions.
- Sketch guiding curves for smooth rotations.
- Shade the solid appropriately to convey depth and dimension.

Quick Tip

When visualizing a 3D solid from 2D rotations, consider the bounding volume and symmetric nature of rotation for accuracy.

Q.9 The schematic plan, front elevation, and side elevation, of an office building block are given below. The direction of the incident sunrays is indicated as 'S'. Sketch the shading and shadows that would be generated by the sunrays in the view of the building block provided in Figure J.



Solution:

Step 1: Understanding light and shadow projection.

- Sunrays are coming diagonally from the top-left, as indicated.
- Protruding parts will cast longer shadows, while recessed parts will remain darker.

Step 2: Identifying shadow regions.

- The left-facing and top-facing surfaces will receive maximum light.
- The right and bottom surfaces will be shadowed.
- Overhangs and recesses will create deep shadows underneath.

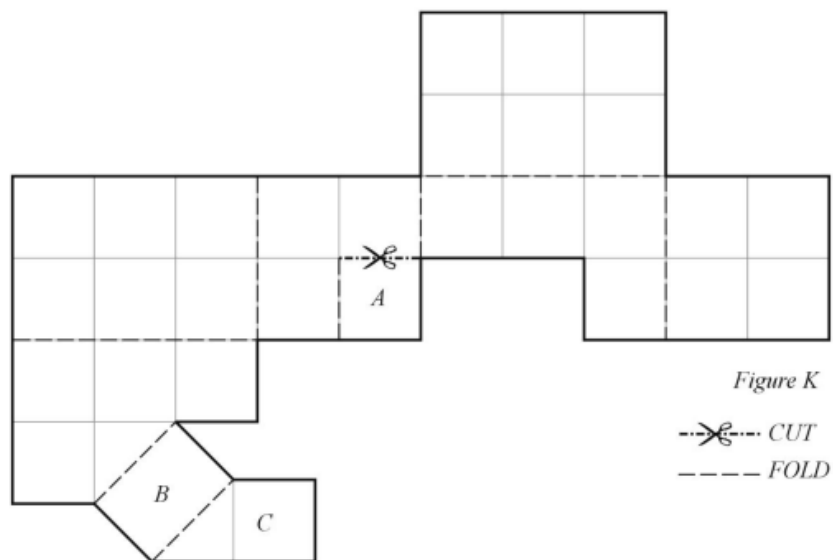
Step 3: Applying shading techniques.

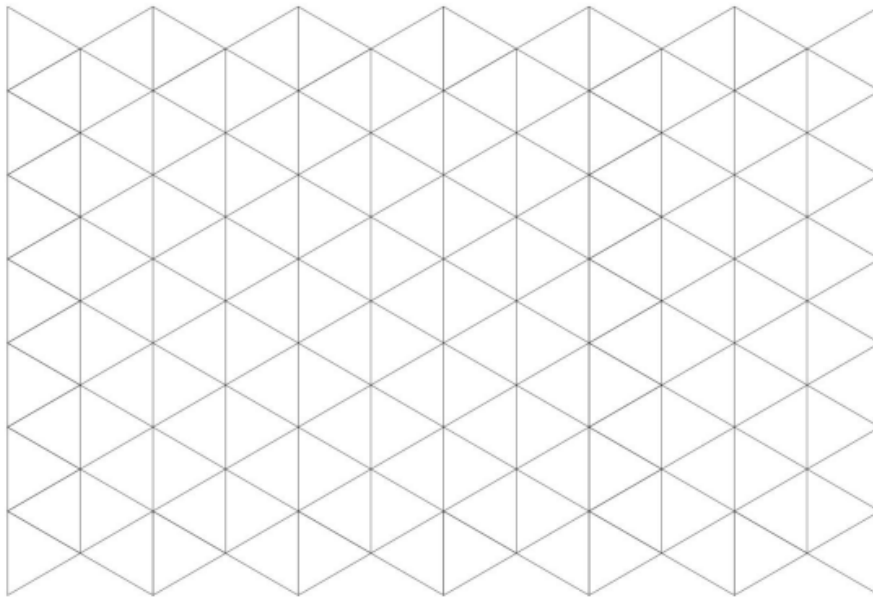
- Use darker tones for shaded areas.
- Gradual shading to represent diffuse shadows.
- Sharp contrast for cast shadows to improve depth perception.

Quick Tip

When sketching shadows, identify the light direction first, then determine which surfaces receive direct light, partial light, or are completely in shadow.

Q.10 Consider the developed surface in Figure K. Lines of cut and fold are indicated. Draw the 3D view of the solid in a manner that the faces A, B, and C are visible.





Solution:

Step 1: Understanding the developed surface.

- The given net consists of rectangular and polygonal faces, which when folded, form a 3D solid.
- Cuts define the edges where the faces separate, while folds indicate where they bend.

Step 2: Folding the net into a 3D form.

- The central square serves as the base or main face.
- Faces A, B, and C will be prominently visible after folding.
- Face B and Face C are angled due to the diagonal fold lines.

Step 3: Sketching the 3D view on the isometric grid.

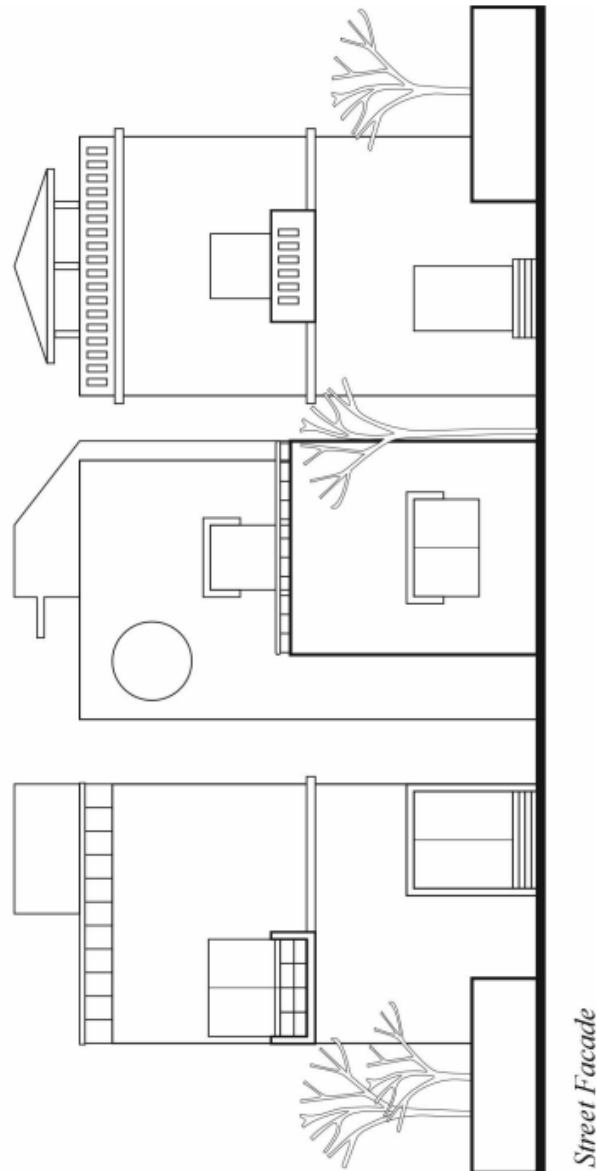
- Use projection techniques to transfer key edges to the 3D plane.
- Ensure faces A, B, and C are clearly visible.
- Hatch or shade surfaces to differentiate visible and hidden areas.

Quick Tip

When visualizing a folded 3D structure, start by identifying the main base face, then sequentially fold the attached faces while maintaining proportions and alignment.

SECTION D

Q.11 Certain cities across the globe are known by their uniquely coloured street façades. Colour the given street façade with minimum three colours of your choice. The façade elements such as cornice, entry steps, door, window, parapet etc. are to be considered while planning the colour scheme for the street façade.



Solution:

Step 1: Understanding the composition of the façade.

- The façade consists of architectural elements such as windows, doors, cornices, parapets, and entry steps.

- These elements should be distinguished using different colours.

Step 2: Choosing an effective colour scheme.

- Select a minimum of three colours for balance.
- Use contrasting or harmonious tones to highlight key elements.
- Neutral tones (white, beige, grey) for walls, and bold colours (red, blue, green) for doors, windows, and cornices.

Step 3: Applying colours strategically.

- Use one primary colour for the base structure.
- Apply accent colours to doors, windows, and decorative elements.
- Ensure balance by distributing the colours evenly across the façade.

Quick Tip

For visually appealing street façades, use a balanced combination of neutral, warm, and cool colours, and highlight architectural features with contrasting tones.

Q.12 Below is the story of a hare and a tortoise narrated in four scenes. Fill up the blank frames with appropriate illustrations to complete the narration. You may add text balloons, if required.

SCENE 1

Once upon a time, Hari, the hare, challenged Tiku, the tortoise, to beat him in a race.



SCENE 2

Hari ran fast, and soon Tiku was left far behind. This made Hari feel confident of winning the race.



SCENE 3

Hari, being a little tired, decided to take a short nap, while Tiku carried on with the race, at his own pace.



SCENE 4

Eventually, Tiku crosses Hari, reaches the finish line, and wins the race.



Solution:

Step 1: Understanding the key moments in the story.

- Scene 2: Show Hare running ahead while Tortoise lags behind.
- Scene 3: Illustrate Hare sleeping under a tree, while Tortoise moves forward.
- Scene 4: Draw Tortoise crossing the finish line, while Hare wakes up too late.

Step 2: Adding appropriate expressions and text balloons.

- Use motion lines to indicate Hare's speed.
- Draw *Zzz...* near Hare's head to show sleeping.
- Include crowd cheering at the finish line to enhance the final scene.

Quick Tip

When illustrating a story sequence, use dynamic poses and expressive facial features to make the characters lively. Directional lines can help convey motion effectively.

Q.13 Re-using waste material is an accepted principle of sustainability. Used tyres are one such waste material. You are required to design and sketch a utility object made of tyres, which could be of different sizes and types (e.g. bicycle, car, two-wheeler tyres, etc.).

Solution:

Step 1: Identifying possible utility objects.

- Tyres can be repurposed into various objects, such as:
- Furniture (chairs, tables, swings).
- Playground equipment (jungle gyms, climbing structures).
- Decorative or functional planters.
- Recycled tyre art for public installations.

Step 2: Designing a concept. - Choose an object that effectively utilizes tyre shapes.

- Incorporate different sizes and arrangements for structural integrity.
- Ensure aesthetic and functional balance in the design.

Step 3: Sketching the object.

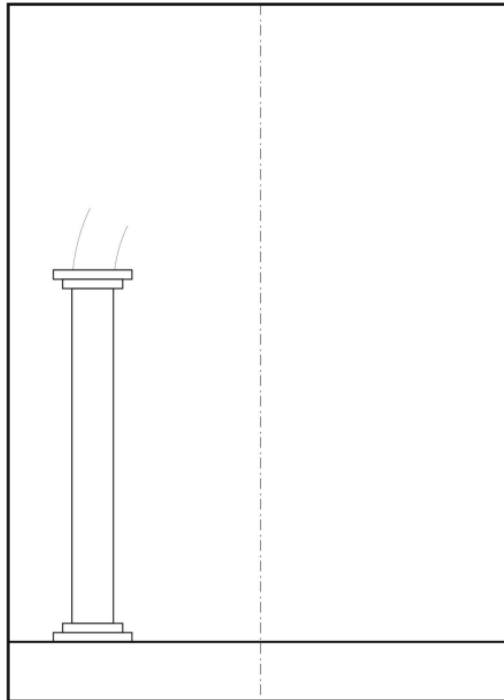
- Illustrate the object with a clear front view.
- Use annotations to explain how tyres are integrated.
- Add texture and shading to give a realistic look.

Quick Tip

When designing with upcycled materials like tyres, focus on structural stability, aesthetic appeal, and multi-functionality. Tyres can be stacked, cut, and reshaped to create innovative designs.

SECTION E

Q.14 An impressive entrance gateway has to be designed for a college. Make a pencil drawing of the elevation of the gateway, adding appropriate elements of your choice. Also, add shade, patterns, and textures. Some indicative outlines of part of the gateway, and a line of symmetry, are given below.



Solution:

Step 1: Identifying architectural elements for the gateway.

- Consider elements such as pillars, arches, decorative motifs, and institutional symbols.
- Ensure symmetry and balanced proportions.

Step 2: Sketching the gateway.

- Use proper scaling to make the structure visually appealing.
- Incorporate column details, engravings, or university emblems.
- Add decorative lamps, intricate patterns, or modern signage.

Step 3: Enhancing realism.

- Use shading techniques to depict depth.
- Add textures for materials like stone, wood, or metal.

Quick Tip

When designing entrance gateways, ensure a harmonious blend of aesthetics and functionality. Symmetry, scale, and detailing enhance the grandeur and visual appeal.

Q.15 Make a pencil sketch of a mug that is commonly used for bathing. The sketch should also show a hand holding the mug. The drawing should be of appropriate form and proportion, showing various parts, materials, and textures, along with shades and shadows.

Solution:

Step 1: Understanding the structure of a bathing mug.

- The mug typically has a cylindrical or slightly tapered body.
- A curved handle is attached to one side for grip.

Step 2: Sketching the hand holding the mug.

- The thumb and fingers should be naturally wrapped around the handle.
- The grip should be proportional to the size of the mug.

Step 3: Adding material details.

- The mug can be made of plastic, metal, or stainless steel.
- Add surface textures and reflective highlights based on the material.

Step 4: Enhancing realism.

- Apply shading techniques for depth and form.
- Cast shadows of the mug and hand to show light direction.

Quick Tip

For sketching objects with hands, observe natural grip positions and proportions. Focus on the curvature of the fingers and how they wrap around the object for a realistic touch.

Q.16 Sketch an interior view of an examination hall, depicting the scene of an examination in progress.

Solution:

Step 1: Understanding the scene composition.

- The examination hall should include rows of desks and chairs.
- Students should be seated and writing their exams.
- An invigilator should be present, monitoring the exam.

Step 2: Adding depth and perspective.

- Use linear perspective to create depth in the hall.
- The desks should be drawn in rows, reducing in size as they recede into the background.

Step 3: Detailing the environment.

- Add windows, doors, ceiling fans, or clocks to indicate a real examination hall.
- Depict students' postures, such as writing, thinking, or looking at their answer sheets.

Step 4: Enhancing realism.

- Use shading techniques to give volume to the desks, chairs, and walls.
- Ensure proportionate figures to maintain a realistic look.

Quick Tip

To effectively sketch an examination hall, use one-point or two-point perspective to create depth. Observe real-life classrooms or halls for reference on spatial arrangements and scale.