

	INDIAN SCHOOL AL WADI AL KABIR		
Class: IX	Department: SCIENCE 2025 – 26 SUBJECT: DESIGN THINKING & INNOVATION		Date of submission: 05-02-2026
Worksheet No: 5 & 6 WITH ANSWERS	MODULE 5, 6, 7 & 8 <ul style="list-style-type: none"> • Fundamentals of Sketching for Ideation Problem Identification and Empathy • Fundamentals of 3D • Introduction to Understanding and Analysis of Problem • Design Project with focus on Products and focus on Problem Analysis and Mappings • Green Skills 		Note: A4 FILE FORMAT
NAME OF THE STUDENT:		CLASS & SEC: IX A TO I	ROLL NO:

MULTIPLE CHOICE QUESTIONS

1. Which of the following is an example of renewable resource?

- A) CNG
- B) Petroleum
- C) Coal
- D) Wind Energy

2. The concept of _____ aims at achieving economic growth that is socially inclusive and environmentally sustainable.

- A) green growth
- B) green skills

- C) green jobs
- D) green economy

3. Those sketches that could be done very quickly are also known as _____.

- A) Representative Sketches
- B) Imaginary Sketches
- C) Rapid Sketches
- D) Indirect Sketches

4. Who is the author of the book 'Drawing from the Right side of Your Brain'?

- A) Pablo Picasso
- B) Betty Edwards
- C) Leonardo da Vinci
- D) Vincent van Gogh

5. 'Seeing and drawing the whole' is also known as _____.

- A) Gestalt drawing
- B) Contour drawing
- C) Negative spaces
- D) Shading

6. What do you mean by the term diminution?

- A) Objects appear distorted as they are angled towards or away from the viewer.
- B) Objects that are higher on the picture plane are farther away than objects that are lower.
- C) Details and textures of objects become less visible as they get farther away.
- D) Parallel lines appear to get closer together as they recede into the distance.

7. _____ simulates natural lighting effects by following light paths, while ray casting is a simpler version that does not include advanced lighting interactions but can still create realistic scenes.

- A) Radiosity
- B) Shading and Lighting Techniques
- C) Texture and Bump Mapping
- D) Ray Tracing

8. How many edges does a cube have?

- A) 4
- B) 8

- C) 6
- D) 12

9. _____ refers to the physical structure, composition, and techniques used to create an artwork, while content encompasses the ideas, emotions, and meanings conveyed through it.

- A) Form
- B) Architecture
- C) Design
- D) Balance

10. Which of the following primitive shape represents ‘a symbol of unity’?

- A) Cube
- B) Pyramid
- C) Sphere
- D) Cone

11. _____ enhance the visual impact of 3-D form, adding depth, realism, and drama to sculptures.

- A) Light and shadow
- B) Shading
- C) Shapes
- D) Structures

12. The following question contains an Assertion followed by a Reason. Read them carefully and select the option that best describes the two statements:

Assertion (A): The cube, with its equal sides and angles, embodies order and stability.

Reason (R): The cube’s geometric precision and straightforwardness make it a powerful tool for conveying structure and balance.

- A) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- B) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- C) (A) is correct but (R) is incorrect
- D) (A) is incorrect but (R) is correct

DESCRIPTIVE TYPE QUESTIONS

1. Define Green Skills.
2. List out the components of 'Green Economy'.
3. What is Green Economy?
4. Explain the method of sketching.
5. What do you mean by Rendering Techniques? Give examples.
6. What are primitive shapes?
7. How do 3-D forms influence architecture?
8. Explain the following primitive shapes.
 - (a) Sphere
 - (b) Pyramid

ANSWER KEY – MULTIPLE - CHOICE QUESTIONS

1	D) Wind Energy
2	A) Green growth
3	C) Rapid Sketches
4	B) Betty Edwards
5	A) Gestalt drawing
6	C) Details and textures of objects become less visible as they get farther away.
7	D) Ray Tracing
8	D) 12
9	A) Form
10	C) Sphere
11	A) Light and shadow
12	A) Both (A) and (R) are correct and (R) is the correct explanation of (A).

SOLUTIONS FOR DESCRIPTIVE TYPE QUESTIONS

1. The skills used for promoting a green economy are known as green skills. The Green Skills Agreement defines skills for sustainability as “Skills for sustainability, also known as green skills, are the technical skills, knowledge, values, and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community.”
2. Renewable energy
Green building
Well-managed (Sustainable)transport
Water management
Waste management
Land management
3. UNEP has defined the green economy as “one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.

4.
 - Sketching is a way of externalizing your ideas and thoughts, making it visible and giving them shape and form.
 - Sketching involves imagination.
 - Sketching can be used for recording or documenting an idea or thought process.
 - Sketching becomes an extension of thinking and makes visible what is in one's mind.
5. Rendering transforms 3-D models into 2-D images or animations, making them more realistic and visually appealing.

Scanline Rendering

Scanline rendering is one of the most traditional methods in computer graphics. This technique involves scanning each polygonal shape, or poly, of a 3-D object based on its y-coordinate. Each poly is converted into a 2-D image in real-time, which helps reduce the download time of the final render.

Z-Buffer Rendering

Z-Buffer rendering calculates the depth value of each pixel, which helps in determining how close or far objects are from the camera. This technique is often paired with Depth of Field (DoF) effects, which add a realistic blur to the background, enhancing the focus on the primary object.

Shading and Lighting Techniques

Shading manipulates light and dark levels, while lighting enhances the realism of a scene. Techniques like flat shading and volumetric lighting are commonly used to make objects appear more three-dimensional and lifelike.

Texture and Bump Mapping

Texture mapping adds color and detail to a 3D model's surface, while bump mapping simulates surface relief. Together, they create the illusion of complex textures without increasing polygon counts.

6. Primitive shapes are basic geometric shapes such as spheres, cylinders, cubes, cones and pyramids that serve as fundamental building blocks in art, design, and architecture.

7. 3 -D forms play a pivotal role in architecture by shaping the design of buildings, influencing spatial relationships and creating a dynamic visual impact.

8.

(a) The Sphere symbolizes unity and completeness. It is the foundation of celestial bodies and the cornerstone of various art forms. Artists and designers use spheres to create harmonious compositions and emphasize spatial relationships within their work.

(b) The pyramid, with its triangular sides converging to a single point, embodies strength and stability. This ancient form has adorned architectural wonders and holds cultural significance across civilizations. In art, pyramids add a sense of grandeur and monumentality to compositions.

Prepared by: Ms. Aleena Joseph	Checked by: AVP – Science & French
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