	INDIAN SCHOOL AL WADI AL KABIR	
Class: X	**Department: SCIENCE 2026 – 27** **SUBJECT: DESIGN THINKING & INNOVATION**	**Date of submission:** **30.10.2026**
Worksheet No: PART B – 7 with answers	**UNIT 7: PART B – INTRODUCTION TO PROTOTYPING**	**Note:** **A4 FILE FORMAT**
NAME OF THE STUDENT	**CLASS & SEC: X A TO I**	**ROLL NO.**

MULTIPLE CHOICE QUESTIONS

1. What is a prototype?

(a) A final product ready for sale
(b) A rough model to test an idea or concept
(c) A digital marketing strategy
(d) A 2D drawing without any functionality
✅ **Answer:** (b) A rough model to test an idea or concept

2. Which of the following is the main purpose of creating a prototype?

(a) To finalize packaging
(b) To get investor funding directly
(c) To test, improve, and communicate the idea
(d) To launch the product in the market
✅ **Answer:** (c) To test, improve, and communicate the idea

3. Which of the following is an example of a low-fidelity prototype?

(a) A 3D printed model with electronics
(b) A working robotic arm
(c) A hand-drawn sketch or paper model
(d) A final manufactured product
✅ **Answer:** (c) A hand-drawn sketch or paper model

4. Which of the following is NOT a key benefit of prototyping?

(a) Helps in user feedback
(b) Saves time and cost
(c) Guarantees no design errors
(d) Improves design before final production
✅ **Answer:** (c) Guarantees no design errors

5. Which stage of the Design Thinking process typically involves creating prototypes?

(a) Empathize
(b) Define
(c) Ideate
(d) Prototype
✅ **Answer:** (d) Prototype

6. Which of the following tools is commonly used for rapid prototyping?

(a) Poster colors
(b) 3D printers
(c) Telephone
(d) Music player
✅ **Answer:** (b) 3D printers

7. What is the first step before making a prototype?

(a) Finalizing packaging
(b) Understanding user needs and defining the problem
(c) Advertising the product
(d) Conducting financial audits
✅ **Answer:** (b) Understanding user needs and defining the problem

8. High-fidelity prototypes are usually:

(a) Rough sketches with no functionality
(b) Fully functional and detailed models

(c) Made only with paper and tape
(d) Cheaper than low-fidelity prototypes
✅ **Answer:** (b) Fully functional and detailed models

9. Which of the following statements about prototyping is TRUE?

(a) Prototyping should only happen at the end of the project
(b) Prototyping allows early testing of ideas
(c) Prototyping is only useful in engineering fields
(d) Prototyping eliminates the need for user feedback
✅ **Answer:** (b) Prototyping allows early testing of ideas

10. Why is user feedback important during prototyping?

(a) It delays the design process
(b) It helps to identify problems and improve the design
(c) It increases the manufacturing cost
(d) It has no impact on the final product
✅ **Answer:** (b) It helps to identify problems and improve the design

DESCRIPTIVE TYPE QUESTIONS

1. What is prototyping and why is it important in the design thinking process?

✅ **Answer:**
Prototyping is the process of creating an early model or sample of a product or idea to test its functionality, appearance, and usability.
It is important because it:

- Helps designers visualize their ideas.
- Allows testing and refining the concept early.
- Encourages user feedback to make improvements.
- Saves time and cost by avoiding large-scale errors in final production.

2. Differentiate between low-fidelity and high-fidelity prototypes with examples.

✅ **Answer:**

- **Low-fidelity prototype:**
  - Simple and inexpensive.
  - Used to represent basic ideas quickly.
  - Example: Paper sketches, cardboard models.

- **High-fidelity prototype:**
  - More detailed, realistic, and functional.
  - Used for final testing before production.
  - Example: A working 3D-printed model, app interface prototype.

3. Explain any three key benefits of prototyping.

✅ **Answer:**

1. **Early Testing of Ideas:** Prototyping allows designers to test the concept and identify issues at the initial stage.
2. **User Feedback:** It helps get real user reactions to improve design and usability.
3. **Saves Cost and Time:** Changes can be made during the early stages instead of after production, which reduces waste of resources.

4. How does prototyping help in understanding user needs better?

✅ **Answer:**
Prototyping helps designers turn abstract ideas into tangible models that users can see, touch, or interact with.
When users interact with a prototype:

- They can give **practical feedback** on what works and what doesn't.
- Designers can **observe user behavior** and identify problems or missing features.
- It ensures the final product is **more aligned with user expectations.**

5. List and explain the basic steps involved in the prototyping process.

✅ **Answer:**

1. **Understand the Problem:** Clearly define user needs and challenges.
2. **Generate Ideas:** Brainstorm solutions.
3. **Select the Concept:** Choose the best idea to prototype.
4. **Build the Prototype:** Create a simple or detailed model.
5. **Test and Get Feedback:** Observe user reactions and make improvements.
6. **Refine and Iterate:** Modify the prototype based on feedback.

6.Give two real-life examples of prototyping and explain their purpose.

✅ Answer:

1. **Mobile App Wireframe:**
   - Designers create a clickable screen layout to check navigation and usability before coding.

- Purpose: To make the app user-friendly and fix issues early.

2. **3D Printed Car Part:**
   - Engineers make a prototype to check fit, strength, and design.
   - Purpose: To ensure the part works correctly before manufacturing in bulk.

7. Why is iteration important in the prototyping process?

✅ **Answer:**
Iteration means **improving the prototype multiple times** based on user feedback and testing.
It is important because:

- The first prototype is rarely perfect.
- Each iteration helps **identify and correct flaws**.
- It ensures the final design is **more efficient, user-friendly, and practical**.
- It saves time and cost by preventing major mistakes in the final product.
  Example: A student making a prototype of a water-saving tap may improve its design after each testing round to ensure smooth flow and less wastage.

8. How does prototyping encourage creativity and innovation among students or designers?

✅ **Answer:**
Prototyping encourages creativity because:

- It allows **ideas to be tested freely without fear of failure**.
- Students can **experiment with different materials, shapes, and functions**.
- Visualizing and building ideas sparks new thoughts and **innovative solutions**.
- It promotes a **hands-on, practical learning** approach.
  Example: While prototyping a smart dustbin, students may come up with additional features like sensors or sound alerts to make it more useful.

Prepared by: **Ms. Aiswarya Deepthi.P**	**Checked by:** **AVP – Science and French**