Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering
End Sem Examination Dec-2023
OE00083 Value Creation Through Design Thinking

Programme: B.Tech. Branch/Specialisation: All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Which of the following industries has widely adopted Design Thinking as a problem-solving approach? **1**

(a) Automotive (b) Healthcare
(c) Banking (d) All of these

ii. What is the goal of Design Thinking? **1**

(a) To create visually appealing products
(b) To solve complex problems
(c) To minimize production costs
(d) To maximize profits

iii. Brainstorming is a process used by groups for problem solving. Which of these is not a characteristic of brain storming? **1**

(a) There is a time limit
(b) Ideas are critically evaluated
(c) Quantity of ideas is foremost
(d) Creativity overrides practicality

iv. Brain storming technique emphasizes the importance of _____ thinking in teaching gifted children". **1**

(a) Convergent (b) Divergent
(c) Lateral (d) Both (b) and (c)

v. _____ is the first and initial phase of the Prototype Model. **1**

(a) Problem identification (b) Design
(c) Testing (d) All of these

vi. In the _____ method, the prototype developed initially is incrementally refined on the basis of customer feedback till it finally gets accepted. **1**
(a) Rapid Throwaway Prototyping
(b) Evolutionary Prototyping
(c) Incremental Prototyping
(d) Extreme Prototyping

vii. Experimental design methods are not used _____. **1**
(a) to evaluate the process capability
(b) in process development
(c) in process troubleshooting to improve process performance
(d) to obtain a process that is robust and insensitive to external sources of variability

viii. Which of these can be obtained by using the Experimental design? **1**
(a) Reduced process capability
(b) Increased variability
(c) Increased cost
(d) Reduced distance from the nominal value

ix. What is the correct order of the 3R principle? **1**
(a) Recycle, Reuse, Reduce (b) Reuse, Reduce, Recycle
(c) Reduce, Reuse, Recycle (d) None of these

x. Environmental science is defined by which of the following statements? **1**
(a) Study of the interactions between the environment's and humans only
(b) Study of the interactions between the environment's and physical components
(c) Study of the interactions between the environment's and chemical components
(d) Study of the interactions between the environment's physical, chemical, and biological components.

Q.2 i. Define critical thinking. **2**
ii. Discuss briefly about the empathy map. **3**
iii. Explain the stages of the design thinking process with neat sketch. **5**
OR iv. Interpret the customer needs identification in detailed manner. **5**

Q.3 i. List out the objectives of brainstorming. **2**
ii. Explain any six thinking hats and SCAMPER brainstorming technique. **8**
OR iii. Explain how to translate user needs into product specifications in detail. **8**

Q.4 i. What are all the steps should be implemented for prototyping model. **3**
ii. Discuss the low - fidelity and high - fidelity prototyping with suitable sketch. **7**
OR iii. Explain minimum viable product with a case study. **7**

Q.5 i. List out all the steps involved to test the business model. **4**
ii. Interpret the nine building blocks of business model canvas with a neat sketch. **6**
OR iii. Discuss the various types of experimental designs of research. **6**

Q.6 Attempt any two:
i. Briefly explain about the environmental design strategies. **5**
ii. Write a short note on life cycle assessment with suitable diagram. **5**
iii. Discuss the different stages of product development process. **5**

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Scheme of Marking

Value Creation Through Design Thinking (T) - OE00083 (T)

Q.1 i) Which of the following industries has widely adopted Design Thinking as a problem-solving approach? **1**

(d) All of the above

ii) What is the goal of Design Thinking? **1**

(b) To solve complex problems

iii) Brainstorming is a process used by groups for problem solving. Which of these is not a characteristic of brain storming? **1**

(a) there is a time limit

iv) Brain Storming technique emphasizes the importance of _____ thinking in teaching gifted children". **1**

(d)Both (b) & (c)

v) ---------- is the first and initial phase of the Prototype Model. **1**

(a)Problem identification

vi) In the ---------- method, the prototype developed initially is incrementally refined on the basis of customer feedback till it finally gets accepted. **1**

(b) Evolutionary Prototyping

vii) Experimental design methods are not used _____ **1**

(a) Evaluating the process capability

viii) Which of these can be obtained by using the Experimental design? **1**

(d) Reduced distance from the nominal value

ix) What is the correct order of the 3R principle? **1**

(c) Reduce, Reuse, Recycle

x) Environmental science is defined by which of the following statements? **1**

d) study of the interactions between the environment's physical, chemical, and biological components.

Q.2 i. Define Critical thinking **2**

Critical thinking – Definition – 2 marks

ii. Discuss briefly about the Empathy map. **3**

By applying Empathy map to sense of the customer feeling - 3 marks

iii. Explain the stages of the design thinking process with neat sketch **5**

Diagram - 2 marks

Description - 3 marks

OR iv. Interpret the Customer Needs Identification in detailed manner. **5**

Products Needs – 2.5 marks

Service Needs – 2.5 marks

Q.3 i. List out the objectives of Brainstorming **2**

objectives of Brainstorming - 2 marks

ii. Explain the 6 thinking hats and SCAMPER brainstorming technique **8**

6 thinking hats - brainstorming technique - 4 marks

SCAMPER - brainstorming technique - 4 marks

OR iii. Explain how to translate user needs into product specifications in detail. **8**

Diagram - 2 marks

Explanation - 6 marks

Q.4	i.	What are all the steps should be implemented for prototyping model. steps for prototyping model – 3 marks	**3**	
	ii.	Discuss the low - fidelity and high - fidelity prototyping with suitable sketch. Diagram - 2 marks Low - fidelity prototyping – 2.5 marks High - fidelity prototyping – 2.5 marks	**7**	
OR	iii.	Explain minimum viable product with a case study. Concept of minimum viable product – 3 marks Case study for minimum viable product – 4 marks	**7**	
Q.5	i.	List out all the steps involved to test the Business Model. Steps to test the Business Model - 4 marks	**4**	
	ii.	Interpret the nine building blocks of Business Model Canvas with a neat sketch. Diagram - 2 marks Explanation - 4 marks	**6**	
OR	iii.	Discuss the various types of experimental designs of research. Pre-experimental Research Design - 2 marks True-experimental Research Design - 2 marks Quasi-Experimental Research Design - 2 marks	**6**	
Q.6				
	i.	Briefly explain about the Environmental Design Strategies Strategies for Environmental Design - 5 marks	**5**	
	ii.	Write a short note on Life Cycle Assessment with suitable diagram. Diagram - 2 marks Description - 3 marks	**5**	
	iii.	Explain cradle-to-grave. and cradle-to-cradle concepts with a neat sketch. Diagram - 1 marks Cradle-to-Grave - 2 marks Cradle-to-Cradle - 2 marks	**5**	

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