OR iii. Solve the following: **7**
(a) What is meant by design ethics?
(b) Describe a situation where a designer might face an ethical dilemma.
(c) What are the potential consequences of unethical design practices?

Q.5 i. Explain the fundamental principles of design thinking and its application in Information Technology (IT). **4**

ii. Evaluate the effectiveness of Agile development practices in a virtual collaboration environment, comparing and contrasting their impact with traditional development methodologies. **6**

OR iii. Solve the following: **6**
(a) Explain the significance of the ideation phase in the Design Thinking process, emphasizing its role in generating innovative solutions to address user needs and challenges.
(b) Analyze the importance of prototyping in the design iteration process, highlighting its function in transforming abstract ideas into tangible representations for user feedback and validation.
(c) Define the concept of testing in the context of design thinking and outline its purpose and objectives for validating prototypes and gathering user feedback.

Q.6 Attempt any two:
i. How is design thinking useful for strategic innovation? "Design thinking is essential for the growth of an organization." Justify. **5**
ii. What is rapid prototyping? Why are organizations currently adopting this strategy? **5**
iii. Using a real-world company as an example, apply the principles of design thinking to analyze and redesign its business model. **5**

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Enrollment No....................................

Faculty of Engineering
End Sem Examination May-2024
EN3ES13 Design Thinking

Programme: B.Tech.   Branch/Specialisation: CSBS

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. Why is design thinking important in problem-solving? **1**
(a) It focuses solely on the aesthetics of a solution
(b) It prioritizes the needs of the business over the user
(c) It encourages a user-centered approach to identify deep insights and generate innovative solutions
(d) It relies on the first idea generated without exploring further options

ii. How are analogies beneficial in the design thinking process? **1**
(a) They restrict the range of ideas to those similar to existing solutions
(b) They provide a direct solution without the need for ideation
(c) They ensure that the design process follows a linear, predictable path
(d) They help in transferring insights from one domain to solve problems in another

iii. A designer is creating a new social media platform. Which of the following considerations is ethically important to include in the design process? **1**
(a) Incorporating features that promote digital well-being and protect user privacy
(b) Maximizing the platform's addictive qualities to increase user engagement
(c) Ensuring the platform's algorithms promote only the most popular content
(d) Designing the platform to collect as much user data as possible for targeted advertising

iv. Which IT product uses the design thinking process first? **1**
   (a) Intel's 8085 microprocessor
   (b) Apple's mouse for the Lisa computer
   (c) Amazon QR Scanner
   (d) Paytm payment bank

v. What is the primary goal of incorporating design thinking into strategic innovation? **1**
   (a) To reduce the cost of product development
   (b) To follow the latest trends in technology
   (c) To improve the aesthetic appeal of products
   (d) To create user-centered solutions that address complex challenges

vi. What is a key component of a business model that defines its competitive advantage? **1**
   (a) Cost structure   (b) Revenue streams
   (c) Value proposition   (d) Customer relationships

vii. During the Testing phase in Design Thinking, a team observes users interacting with their prototype to assess its usability. Which of the following is a key aspect they should focus on? **1**
   (a) The aesthetic appeal of the prototype
   (b) The ease with which users can complete tasks using the prototype
   (c) The number of features in the prototype
   (d) The users' emotional response to the prototype

viii. Which of the following is a common design limitation in IT products that can affect user satisfaction? **1**
   (a) Limited battery life   (b) User-friendly interface
   (c) Wide range of features   (d) High performance

ix. During the design thinking process, after the ideation phase has generated a wide range of ideas, what is the next step that typically involves building a scaled-down version of the product to investigate the ideas generated? **1**
   (a) Market Analysis   (b) Prototyping
   (c) Final Implementation   (d) Launch

x. Which of the following is NOT a commonly used tool in the design thinking process? **1**
   (a) Empathy Maps   (b) Customer Journey Maps
   (c) Feasibility Studies   (d) Financial Accounting Software

Q.2 i. What do you mean by design thinking, and state its four principles? **2**

ii. Define and differentiate between innovation and creativity. **3**

iii. (a) How might we integrate user feedback more effectively into our iterative design process to enhance product usability? **5**
   (b) What criteria should we use to assess the success of design thinking workshops in fostering innovation and collaboration within our teams?

OR iv. Discuss the ten most valuable tools for design thinking. **5**

Q.3 i. What is the primary goal of fostering creative thinking and innovation within a business? **2**

ii. Solve the following: **8**
   (a) Imagine you're an archaeologist who has discovered an ancient device with symbols that no one can decipher. How would you use items found in a typical office to devise a method for cracking the code?
   (b) Your city is hosting a festival to celebrate innovation, and you've been tasked with creating an interactive exhibit that showcases the power of collaborative thinking. What unique activity would you design to engage participants from diverse backgrounds and skill levels?
   (c) If you were to create a mind map representing the Internet as a living organism, what would be at the heart of it, and how would you illustrate the connections between its 'organs' to reflect the complexity and interdependence of online ecosystems?

OR iii. Solve the following: **8**
   (a) Provide examples where lateral thinking and analogical reasoning led to breakthroughs or innovative solutions, highlighting the creativity and ingenuity demonstrated.
   (b) Assess the efficiency and efficacy of brainstorming sessions facilitated by mind mapping techniques in generating ideas or solving complex problems.

Q.4 i. Discuss the five-step design process. **3**
ii. Solve the following: **7**
   (a) Explain how creativity is integral to the design process, using examples to illustrate your points.
   (b) Describe the significance of innovation within the design process, highlighting key principles & strategies for fostering innovation.

Marking Scheme

EN3ES13 (T) Design Thinking

Q.1 i)   s   1
     ii)   D   1
     iii) A   1
     iv)   B   1
     v)   D   1
     vi)   C   1
     vii) B   1
     viii) A   1
     ix)   B   1
     x)   D   1

Q.2 i.   What do you mean by design thinking, and state its four   2
           principles?

           Design thinking definition or illustration. – 1 mark
           Listing of four principle – 1 mark
     ii.   Define and differentiate between innovation and creativity. 3

           Defining innovation and creativity – 1 mark
           Listing at least four differences between innovation and creativity
           – 2 marks
     iii. a. How might we integrate user feedback more effectively into our   5
           iterative design process to enhance product usability?

           Students can use two methods to integrate feedback: 2 marks.

           b. How can we measure the impact of design thinking practices on
           our business performance and decision-making processes?

           Students can give one measurement – 1 mark.

           c. What criteria should we use to assess the success of design
           thinking workshops in fostering innovation and collaboration
           within our teams?

           Students able to give at least two criteria – 2 marks
OR   iv.   Discuss the ten most valuable tools for design thinking.   5

Students can give the following ten tolls of design thinking with 1-2 lines discussion – 5 marks (And part marking thereof)
- Visualization
- Journey mapping (or experience mapping)
- Value chain analysis
- Mind mapping
- Rapid concept development
- Assumption testing
- Prototyping techniques
- Customer co-creation
- Learning launches
- Storytelling

Q.3 i.   What is the primary goal of fostering creative thinking and   2
           innovation within a business?

           Students can give two primary goals for creative thinking and
           innovation within a business. – 2 Marks
     ii.   a. Imagine you're an archaeologist who has discovered an ancient   8
           device with symbols that no one can decipher. How would you
           use items found in a typical office to devise a method for cracking
           the code? (2)

           If the student can explain this using the concept of lateral thinking
           in design thinking, – 2 marks

           b. Your city is hosting a festival to celebrate innovation, and
           you've been tasked with creating an interactive exhibit that
           showcases the power of collaborative thinking. What unique
           activity would you design to engage participants from diverse
           backgrounds and skill levels? (4)

           Students can give four brainstorming points – 4 marks.

           c. Student can discuss two analogies between internet & Human
           like nerve system (2)
OR   iii. a. Provide examples where lateral thinking and analogical   8
           reasoning led to breakthroughs or innovative solutions,
           highlighting the creativity and ingenuity demonstrated. (4)

Two examples where lateral thinking led to breakthroughs or innovative solutions. – 2 Marks

Two examples where analogical reasoning led to breakthroughs or innovative solutions – 2 Marks

b. Assess the efficiency and efficacy of brainstorming sessions facilitated by mind mapping techniques in generating ideas or solving complex problems. (4)

Two Efficiency descriptions of brainstorming sessions facilitated by mind mapping techniques in generating ideas or solving complex problems. – 2 Marks

Two Efficacy of brainstorming sessions facilitated by mind mapping techniques in generating ideas or solving complex problems. – 2 Marks

Q.4   i.   Empathy, Define, Ideate, Prototype & Test.   **3**

ii.   a. Explain how creativity is integral to the design process, using examples to illustrate your points. (4)   **7**

Explanation – 2 Marks and Two Examples – 2 Marks

b. Describe the significance of innovation within the design process, highlighting key principles and strategies for fostering innovation. (3)

One significance – 1 mark
One key principle – 1 mark
One strategy – 1 mark

OR   iii.   a. What is meant by design ethics? (2)   **7**

Definition – 1 mark

Example/Explanation – 1 Mark

b. Describe a situation where a designer might face an ethical dilemma. (2)

Illustrating the situation and explaining – 2 Marks

c. What are the potential consequences of unethical design practices? (3)

Three potential consequences with reason – 3 Marks

Q.5   i.   Explain the fundamental principles of Design Thinking and its application in Information Technology (IT).   **4**

Define Design Thinking and how Design Thinking fosters user-centric problem-solving in IT – 2 Marks
Identify and explain at least two specific techniques/examples – 2 Marks

ii.   Evaluate the effectiveness of Agile development practices in a virtual collaboration environment, comparing and contrasting their impact with traditional development methodologies.   **6**

The answers of students should contain the following
- Analysis of the key principles and values underlying Agile development – 1 Mark
- Comparison between Agile methodologies and traditional – 1 Mark
- Application of Agile techniques – 1 Mark
- Analysis of Agile-specific challenges in virtual collaboration – 1 Mark
- Examination of the role of Agile ceremonies – 1 Mark
- Recommendations for organizations transitioning to Agile development in virtual collaboration environments – 1 Mark

OR   iii.   a. Explain the significance of the ideation phase in the Design Thinking process, emphasizing its role in generating innovative solutions to address user needs and challenges. (2)   **6**

Explanation – 1 Mark and One role discussion – 1 Mark

b. Analyze the importance of prototyping in the design iteration process, highlighting its function in transforming abstract ideas into tangible representations for user feedback and validation. (2)

Importance of Prototype – 1 Mark and One function – 1 mark

c. Define the concept of testing in the context of design thinking and outline its purpose and objectives for validating prototypes and gathering user feedback. (2)
Concept of testing – 1 Mark and Purpose and objective – 1 Mark

Q.6   i.   How is Design Thinking useful for strategic innovation? (3)   **5**

      Students give three or more reasons – 3 Marks

      "Design thinking is essential for the growth of an organization."
      Justify (2)

      Students give two or more reasons – 2 Marks
      ii.   What is rapid prototyping, and why are organizations currently   **5**
            adopting this strategy? (2+3)
            Definition with an example – 1 Marks
      iii. Using a real-world company as an example, apply the principles   **5**
            of Design Thinking to analyze and redesign its business model.

            This question requires students to apply their knowledge of
            Design Thinking to a practical scenario (application) and to
            analyze the components and outcomes of a business model
            (analysis). – 5 Marks

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