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RAMAIAH Institute of Technology

(Autonomous Institute, Affiliated to VTU)
(Approved by AICTE, New Delhi & Govt. of Karnataka)
Accredited by NBA & NAAC with 'A+' Grade

SEMESTER END EXAMINATIONS – MAY 2023

Program	:	**B.E. – Common to ECE / EEE / EIE /ETE / MLE / ME / IEM / CH**	**Semester**	:	**I**
Course Name	:	**Design Thinking**	**Max. Marks**	:	**100**
Course Code	:	**AECC17**	**Duration**	:	**3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit

UNIT – I

1.	a)	What is Design Thinking? How Does Design Thinking Work?	CO1	(06)
	b)	Why Companies Need to Apply Design Thinking.	CO1	(06)
	c)	Reason out the importance of 4 C's namely critical thinking, creative thinking, communicating, and collaborating in as essential skillsets for students with suitable example.	CO1	(08)
2.	a)	Write your understanding of the four methods applied to design thinking	CO1	(06)
	b)	If a designer need to work with the full potential towards design, what would be the key mindsets required to achieve it ? Analyse why and how.	CO1	(06)
	c)	Given below are organizations : (i) NETFLIX (ii) UBER. Justify how two well-known brands that have leveraged design thinking to solve business problems	CO2	(08)

UNIT- II

3.	a)	Identify the target user market for waterproof coating, and explain briefly why you chose that group.	CO2	(05)
	b)	What is the importance of 'how might we' question?	CO2	(05)
	c)	Write ten interview questions to ask students of rural areas who have problems pertaining to education through online classes.	CO2	(10)
4.	a)	What is synthesis phase? What does one do during this phase?	CO2	(05)
	b)	What is empathy map? What are its uses?	CO2	(05)
	c)	Write ten interview questions to ask hospital staff pertaining to the issues regarding disposable gloves and needles.	CO2	(10)

UNIT- III

5.	a)	What are some myths pertaining to creativity, and what is the truth pertaining to them?	CO3	(05)
	b)	What are some rules to remember during prototype phase?	CO3	(05)
	c)	Generate atleast three different engineering solutions to reduce traffic jams in Bengaluru.	CO3	(10)
6.	a)	Generate atleast three different solutions/ ideas for solving the issue of death due to manual cleaning of sewage blocks.	CO3	(10)
	b)	What are some principles that were learnt from IDEO and the shopping cart challenge?	CO3	(05)
	c)	How does one 'plus' upon the idea of others? Why is this done?	CO3	(05)

UNIT- IV

7.	a)	What is the end goal of testing stage in design thinking? How is Testing without end user conducted?	CO4	(10)
	b)	Scenario: While playing beach tennis on vacation, James was wondering: "How come these beach ball sets always wear out by the end of the vacation?" It struck me that these cheap pallets are a good example of fine value engineering. He gets just enough value for the lowest possible price. He paid Rs.300/- for a set that he only intended to use for a few weeks anyway. Does the above scenario fit in as an example of value engineering? Consider two takeaways of value analysis and discuss.	CO4	(10)
8.	a)	What are the benefits of testing in design thinking? How is User-Testing conducted?	CO5	(10)
	b)	Scenario :The production process of a pencil was analyzed using the value analysis technique to reduce cost. Wood and paint were the two most expensive elements in producing the pencil, which shared 37.5% of the pencil's total cost.A round-shaped design for the pencil was suggested instead of the hexagonal-shaped design to reduce the manufacturing time and manufacturing cost. In addition, normal paints were suggested instead of expensive glitter paints, and additional care was required while applying them to wood. With the suggested design changes, the production cost of each pencil was reduced by 25%. Does the above scenario fit in as an example of value engineering? Consider two takeaways of value analysis and discuss.	CO5	(10)

UNIT- V

9.	a)	According to the Food and Agriculture Organization, the 33% of all food every year gets wasted throughout the supply chain, from initial agricultural production through household consumption. Your team is assigned a project to minimize food wastage in your college hostel mess. Give you project plan using design thinking approach for the following phases: i) Collecting information using Empathy techniques such as interview and research. ii) Formulating a problem statement with two 'How Might We' questions.	CO5	(10)
	b)	Your project team is planning to build a prototype of a scalable smart village to simultaneously create sustainable development and enterprise growth opportunities. Your team decides to use rapid prototyping techniques. Answer the following with reference to the above. i) What are the basic rules for rapid prototyping? ii) On what basis will you select a mentor? iii) Elaborate on what tools and materials you would use to build this prototype. Justify your selection.	CO5	(10)

10. a) The Danes, like citizens in most developed countries, recognize that the aging of their population presents many challenges. One of these is serving the more than 125,000 senior citizens who rely on government-sponsored meals. Danish municipalities deliver subsidized meals to people who suffer from a reduced ability to function, due to illness, age, or other conditions. Many of the seniors have nutritional challenges and a poor quality of life because they simply do not eat enough. In fact, it is estimated that 60% of Denmark's seniors in assisted living facilities or residential care units have poor nutrition, and 20% are malnourished. The result is both health problems and a low quality of life for the elderly and a greater economic burden on the government. The problem only looks to intensify as the number of senior citizens grows and future generations of seniors expect greater choice and better service. CO5 (10)

Answer the following questions with reference to the above case.

i) Formulate a problem statement identifying key elements.
ii) Frame two how might we questions.
iii) Create an empathy map by writing two questions for each block of the empathy map.

b) What is data-driven design? How to use data in your design process? Explain the above with the help of a relevant case study example. CO5 (10)

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