KUMARAGURU
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Register Number:………….……

M.E / M.TECH DEGREE EXAMINATIONS: APRIL / MAY 2024

(Regulation 2018)

Second Semester

COMMON TO BIO / EST

P18INT0002: Product Design and Development

COURSE OUTCOMES

CO1:   Apply concepts of product development and outline product planning process.

CO2:   Apply relative importance of customer needs in establishing product specifications.

CO3:   Identify concept generation activities and summarize the methodology involved in concept selection and testing.

CO4:   Outline supply chain considerations in product architecture and understand the industrial design process.

CO5:   Apply design for manufacturing concepts in estimating manufacturing costs.

CO6:   Apply principles of prototyping in product development economics and highlight importance of managing projects.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Assertion (A): AMF products are assembled from components fabricated with   CO1   [K_1]
    conventional processes.
    Reason (R): AMF product is not process intensive like other consumer goods.

    a)   Both (A) and (R) are correct and (R) is   b)   Both (A) and (R) are correct and (R) is
          the right explanation of (A)   not the right explanation of (A)

    c)   (A) is correct and (R) is incorrect   d)   (A) is incorrect and (R) is correct

2. Product planning is a -------------- process.   CO1   [K_1]

    a)   Seven step   b)   Eight step

    c)   Six step   d)   Five step

3. The unprocessed data that is not organized or analyzed is termed as   CO2   [K_2]

    a)   Refined data   b)   Raw data

    c)   First hand data   d)   Pre analyzed data

4. Match the item with multiple choice code   CO2   [K$_2$]

List I	List II
A. Supply inventories	i. Maslow
B. Hierarchy of needs	ii. Production map
C. Customer specification	iii. Raw data
D. External stakeholders	iv. Goal of development team

	A	B	C	D
a)	ii	iii	i	iv
b)	i	ii	iii	iv
c)	iii	ii	iv	i
d)	i	ii	iv	iii

5. Assertion (A): A research method that involves asking customers questions about the   CO3   [K$_2$]
concepts and ideas for a product or a service before launching.
Reason (R): Customer's acceptance and their willingness to buy a product cannot be
gauged before the product is launched.

a) Both (A) and (R) are correct and (R) is   b) Both (A) and (R) are correct and (R) is
the right explanation of (A)   not the right explanation of (A)
c) (A) is correct and (R) is incorrect   d) (A) is incorrect and (R) is correct

6. The top factor that determines survey accuracy is   CO3   [K$_1$]

a) Target population   b) Statistics

c) Sourcing   d) Sampling

7. Consider the platform product development approach includes four phases: and arrange   CO4   [K$_2$]
in sequence.

i) the establishment of appropriate product platform. ii)customization of platform

iii)platform based customized model. iv) Development of product modeling language.

a) i,ii,iii,iv   b) ii,iii,i,iv

c) i,iv,iii,ii   d) i,ii,iv,iii

8. Assertion (A): Designing is an integral part of problem solving.   CO4   [K$_2$]
Reason (R): Designing enables to create products that meet the needs and preferences
of the users.

a) Both (A) and (R) are correct and (R) is   b) Both (A) and (R) are correct and (R) is
the right explanation of (A)   not the right explanation of (A)
c) (A) is correct and (R) is incorrect   d) (A) is incorrect and (R) is correct

9. ------------ prototyping is a group of techniques used to quickly fabricate a scale model   CO5   [K$_1$]
of a physical part or assembly.

a) Rapid   b) 3D

c) CAD   d) Additive

| 10. | Which of these are in correct sequence? | CO6 | [K2] |

10. Which of these are in correct sequence?
i) Sensitivity analysis is the study of the uncertainty of a project.
ii) Uncertainty analysis focuses on uncertainty quantification.
iii) Testing the robustness of the results is final in uncertainty analysis
iv).The impact of a variable is analyzed in uncertainty analysis.

a)   i,ii,iii,iv   b)   ii,iii,i,iv

c)   i,iv,iii,ii   d)   i,ii,iv,iii

CO6 [K2]

PART B (10 x 2 = 20 Marks)

11.	Define AMF development process.	CO1	[K1]
12.	Infer the significance of resource allocation.	CO1	[K2]
13.	Relate the meaning of raw data.	CO2	[K1]
14.	Recall the target specifications for new products.	CO2	[K1]
15.	State the purpose of concept test.	CO3	[K1]
16.	Tell the importance of customer response in product development.	CO3	[K2]
17.	Explain the impact of DFM in manufacturing.	CO4	[K2]
18.	What is the need of assessing manufacturing cost in product development?	CO5	[K2]
19.	Define prototype.	CO5	[K1]
20.	Outline the concept of baseline project planning.	CO6	[K2]

PART C (10 x 5 = 50 Marks)

21.	Illustrate the characteristics of successful product development.	CO1	[K3]
22.	Indicate steps to identify opportunities in product planning process.	CO1	[K3]
23.	What are the methods of interpreting raw data in terms of customer needs?	CO2	[K2]
24.	Relate the significance of target specifications in product development.	CO2	[K2]
25.	Interpret the steps in problem clarification by external search in concept generation.	CO3	[K3]
26.	How measuring customer response is important in concept testing?	CO3	[K3]
27.	Discuss the meaning of product architecture with an example.	CO4	[K3]
28.	What is the effect of reduction in component cost with manufacturing cost?	CO4	[K3]
29.	Summarize the elements of economic analysis.	CO5	[K2]
30.	Outline the influence of postmortem project evaluation in product development.	CO6	[K2]

Answer any TWO Questions
PART D (2 x 10 = 20 Marks)

31.	Elaborate the purpose of concept testing. Delineate the survey formats and methods to choose survey population.	CO4	[K3]

32. "The field of industrial design is growing in scope as consumer preferences and technology progress"-Assess the need for ID in product development. CO5 [K4]

33. Formulate the basic principles, technologies and planning for prototypes with a case study in industry. CO6 [K3]

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