Register Number:……..

KUMARAGURU
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B.TECH DEGREE EXAMINATIONS: NOV/DEC 2016

(Regulation 2015)

Third Semester

BIOTECHNOLOGY

U15GST006: Product Design And Development

COURSE OUTCOMES

CO1: Understand the process to plan and develop products

CO2: Understand the process of collecting information and developing product specifications

CO3: Understand the concept generation, selection and testing processes

CO4: Understand the concepts of product architecture, industrial design and design for manufacture

CO5: Understand the basics of prototyping, economic analysis

CO6: Understand the concept of project planning and execution processes

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

Answer all the Questions

PART A (10 x 1 = 10 Marks)

1. **Assertion (A)**: Product quality is ultimately reflected in market share and the price that customers are willing to pay. CO1 [K_2]

   Reason (R): Product cost determines how much profit accrues to the firm for a particular sales volume and a particular sales price.

   a) Both (A) and (R) are true and (R) is the correct reason for (A)
   b) Both (A) and (R) are true and (R) is not the correct reason for (A)
   c) (A) is false but (R) is true
   d) (A) is true but (R) is false

2. Match list I (Quantities) with list II (Dimensions) and select the correct answer using the codes given below. CO1 [K_2]

List I	List II
A. Lack of empowerment of the team	1. Representatives may influence decisions
B. Inadequate resources	2. Key development decisions may be made without involvement of teams
C. Lack of cross-functional representation	3. Lack of staff and a mismatch of skills
D. Functional allegiances transcending project goals	4.General manager's continual intervention in product development

a) A-1, B-2, C-3, D-4 b) A-2, B-3, C-4, D-1

c) A-3, B-4, C-1, D-2 d) A-4, B-3, C-2, D-1

3. **Assertion (A)**: The major results of the front-end activities can be usefully captured in a contract book CO2 [K_2]

Reason (R): Mission statement excludes the description of the product

a) Both (A) and (R) are true and (R) is the correct reason for (A) b) Both (A) and (R) are true and (R) is not the correct reason for (A)

c) (A) is false but (R) is true d) (A) is true but (R) is false

4. The term "Product specification" is not analogous to the following term CO2 [K_3]

a) Product requirements b) Engineering characteristics

c) Technical specifications d) Physio-chemical properties

5. A product concept is the description of the following CO3 [K_4]

A. Technology

B. Working principle

C. Form of the product

D. Final specifications

Which is the correct sequence?

a) A-C-D b) A-B-D

c) A-B-C d) B-C-D

6. Match list I (Terms) with list II (Definition) and select the correct answer using the codes given below. CO3 [K_4]

List I	List II
A. Functional decomposition	1. People who experience needs months
B. Decomposition by sequence of user actions	2.Create a function diagram of an existing product
C. Decomposition by key customer needs	3. Useful for products with simple technical functions
D. Lead users	4.Useful for products for which principles or technology, is the primary problem

a) A-1, B-2, C-3, D-4 b) A-2, B-3, C-4, D-1

c) A-3, B-4, C-1, D-2 d) A-4, B-1, C-2, D-3

7. **Assertion (A)**: Integral architectures are those in which the implementation of functional elements is spread across chunks, resulting ill-defined interactions between the chunks CO4 [K_4]

Reason (R): The product architecture cannot enable postponement, the delayed differentiation of product, which does not offer substantial potential cost savings

a) Both (A) and (R) are true and (R) is the correct reason for (A)
b) Both (A) and (R) are true and (R) is not the correct reason for (A)
c) (A) is false but (R) is true
d) (A) is true but (R) is false

8. The assignment of the functional elements of a product to the physical building blocks of the product is termed to be — CO4 [K_2]

a) Product architecture
b) Modeling
c) Industrial design
d) Prototype

9. Select the second dimension of prototyping — CO5 [K_2]

a) Analytical
b) Physical
c) Comprehensive
d) Non-tangible

10. Consider the following statements based on the economic analysis. — CO6 [K_2]

1. Build a base-case financial model.
2. Use the sensitivity analysis to complicate project budget.
3. Further exclude the sensitivity analysis to remove the relationships between financial success and the key assumptions and variables of the model.
4. Consider the influence of the qualitative factors on project success.

Which are the correct statements?

a) 1,2
b) 2,3
c) 3.4
d) 1.4

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. Define product development process. — CO1 [K_2]
12. Differentiate functional organization and project organization. — CO1 [K_2]
13. List out the goals for identifying customer needs. — CO2 [K_2]
14. Distinguish marginal value and target value. — CO2 [K_2]
15. Recite the possible methods to search for product concepts externally. — CO3 [K_2]
16. What do you mean by selection matrix? — CO3 [K_1]
17. Deduce the properties of modular architecture. — CO4 [K_1]
18. Name the five important goals of an industrial engineer. — CO4 [K_2]
19. List the elements of economic analysis. — CO5 [K_2]
20. What is senstive analysis? — CO6 [K_4]

Answer any FIVE Questions
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21.	a)	Outline the characteristics of product development.	CO1	[K_4]
	b)	Summarize the three functions which are central to a product development project.	CO1	[K_2]
22.	a)	Interpret the four types of product development projects.	CO1	[K_3]
	b)	What are the short comes of inefficient product planning.	CO1	[K_2]
23.	a)	What is mission statement? Discuss its importance.	CO2	[K_2]
	b)	Mention some of the general hints for effective interaction with customers.	CO2	[K_3]
24.		Elaborate on the available apparent methods to external search for solutions.	CO3	[K_3]
25.	a)	Discuss the key motives for product change.	CO4	[K_4]
	b)	Assess the importance of industrial design using the ergonomic dimensions.	CO4	[K_3]
26.		Discuss in detail about the principles of prototyping.	CO5	[K_3]
27.		Explain the concept of CAVEATS with an illustration.	CO6	[K_3]

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