

5. Attempt any *two* of the following questions :— (10×2=20)

- Define work-study and write the benefits and basic steps of work study.
- Describe the fundamentals of statistical control. Write the application and limitation of SQC.
- What do you mean by standardization, simplification and specialization ? Write their advantage, disadvantage and linkage.

Plant (II)	Plant (I)	
60%	100%	Capacity operation
240	600	Sales (Rs. in lacs)
150	440	Variable cost (Rs. in lacs)
40	80	Fixed cost (Rs. in lacs)

4. Attempt any two of the following questions :— (10×2=20)

- Define reliability and derive reliability law.
- A room contains three independent light bulbs controlled from a single switch. The bulbs and switch fail independently. In addition the switch can fail to close but can never fail to open. The reliability of switch and light bulbs are 0.9 and 0.7 respectively. Calculate the probabilities that room will be lit.
- Describe the essential factors considered in designing the control. Explain man-machine interface.
- What is meant by Ergonomics and Anthropometric data and its importance ?

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2952 Roll No.

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B. Tech.

(SEM. VIII) THEORY EXAMINATION 2011-12

PRODUCT DEVELOPMENT

Time : 3 Hours

Total Marks : 100

Note :—(1) Attempt *all* questions.

(2) All questions carry equal marks.

(3) Be precise in your answers.

1. Attempt any *four* of the following questions :— (5×4=20)

- What is meant by product-definition ? Give product-classification.
- Draw and explain Production-Consumption-Cycle.
- Name the various stages of Product Development. Explain the first stage.
- Explain Original design, Adaptive design and Variant design.
- What is Design by Evolution ? Explain the characteristic features and disadvantage of Design by Evolution.
- Differentiate between Need based Development and Technology based Development. Give examples.

2. Attempt any *four* of the following questions :— (5×4=20)

- What is Morphology of Design ? Draw the diagram showing its phases of Primary design and phases related to Production-Consumption-Cycle.

- (b) Explain the Divergence, Transformation and Convergence phases of product design.
- (c) Make a check list to facilitate the need analysis.
- (d) Write design strategies for Strength based design, Rigidity based design and Impact based design.
- (e) What is Product Aesthetic ? How the product message is created ?
- (f) What is creativity ? Describe the mental blocks to creativity.

3. Attempt any *two* of the following questions :—

(10×2=20)

- (a) What is synthetic technique used in product design ?
- (b) Explain the concept of utility and law of diminishing marginal utility.

Suggest which of the following alternatives is to be decided under uncertainty using regret criterial :—

Pay-off Table

Condition	Outcome of Alternative		
	A	B	C
x	700	500	300
y	300	450	300
z	150	0	300

- (c) What is break-even analysis ? What is included in fixed cost and in variable cost ?

The two plants with following particulars are manufacturing same product under one corporate management, which decide to merge them. Calculate :

- (i) The capacity of merged plant to achieve break even.
- (ii) The profitability on working at 75% of merged capacity.

	Plant (I)	Plant (II)
Capacity operation	100%	60%
Sales (Rs. in lacs)	600	240
Variable cost (Rs. in lacs)	440	150
Fixed cost (Rs. in lacs)	80	40

4. Attempt any *two* of the following questions :— (10×2=20)

- (a) Define reliability and derive reliability law.

A room contains three independent light bulbs controlled from a single switch. The bulbs and switch fails independently. In addition the switch can fail to close but can never fail to open. The reliability of switch and light bulbs are 0.9 and 0.7 respectively. Calculate the probabilities that room will be lit.

- (b) Describe the essential factors considered in designing the control. Explain man-machine interface.
- (c) What is meant by Ergonomics and Anthropometric data and its importance ?