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Printed Pages—4

ME—501

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

PAPER ID : 4014

Roll No.

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B.Tech.

FIFTH SEMESTER EXAMINATION, 2005-2006

PRODUCT DEVELOPMENT AND DESIGN

Time : 2 Hours

Total Marks : 50

- Note :** (i) Attempt *ALL* questions.
(ii) Give suitable examples in support of your answer.
(iii) Be precise in your answer.

1. Attempt *any two* parts of the following :

- (a) What are major differences between old and new design methods ? "The development of communication systems in the present era is technology based development". Explain giving examples. (4+3)
- (b) "Design by evolution is a slow need-based process". Justify the statement with the help of evolution of any product - say safety razor - explaining clearly the necessity of making changes in the product development process. (7)

- (c) Sometimes the demand for a good product suddenly reduces because of new innovations/new technology. Give seven examples, explaining in each case (i) the competitive product/technology (ii) its major advantages over the old product (iii) to what extent the new product has replaced the old one. (7)

2. Attempt *any two* parts of the following :

- (a) Explain what do you understand from design - morphology? Discuss all the three phases of product design. What is the difference between "Specifications" and "Performance Parameters"? Explain how changing the "need statement" results into a different search direction/product. (2+1+1+2)
- (b) What do you understand from "ideation" ? Explain how mental blocks reduce the creative ideation capability of individuals. With the help of suitable examples explain how "analogy" helps in getting new ideas. (1+2+3)
- (c) Carry out the "need analysis" for the problem of washing and drying hands in the hostel mess with a capacity of about 300 students. Give a proper need statement, specifications, performance parameters and constraints for this problem. (2+1+2)

3. Attempt *any two* parts of the following :

- (a) Write a brief note on Brain storming. What is the difference between brain storming and synectics? Give one examples to explain the application of brain storming technique in generating new ideas. (3+1+2)

- (b) A customer carries out market survey for coloured Television and the data for four types of sets - A, B, C & D are given below. Calculate the composite utility index for each type and indicate to the customer which Television set he should select. (6)

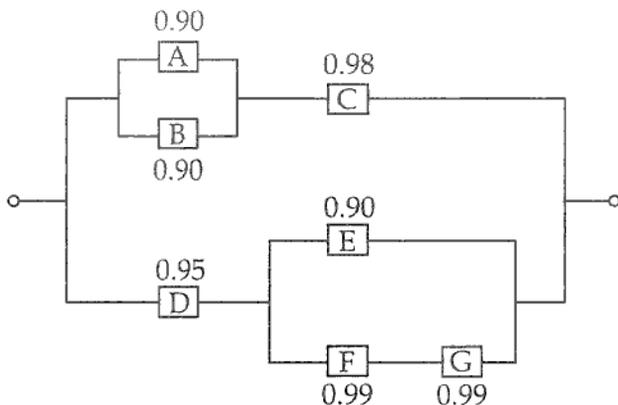
Attributes	Weightage	Limits of attributes	Television sets			
			A	B	C	D
Brand Equity	20%	Minimum 5	8.5	7.8	9.0	7.0
Picture Quality	35%	Minimum 5.5	8.8	7.0	8.2	7.3
Maintenance Rs. per year	15%	Maximum Rs. 100/-	10/-	50/-	10/-	80/-
Cost Rs.	30%	Maximum Rs. 20,000/-	18,500	17,000	19,000	16,700

- (c) Explain the difference between fixed cost and variable cost. A company is producing a single item and is selling at Rs. 10 per unit. The fixed cost is Rs. 40,000 per year and the variable cost is Rs. 6. Calculate : (1+5)
- Sales volume to earn a profit of Rs. 5,000 per year.
 - The break-even sales volume if the selling price is reduced by 10%.

4. Attempt *any two* parts of the following :

- (a) What do you understand from reliability of a system ? Using bath-tub curve discuss useful life period of a product. Why the initial failure rate is high ? (2+3+1)

- (b) Find the reliability of system given below where number indicate component reliability. (6)



- (c) What do you understand from Man-Machine interface? Giving examples explain the important points to be considered in the design of display systems. (2+4)

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