EIGHTH SEMESTER B.TECH. DEGREE EXAMINATION

MODEL QUESTION PAPER

13.804 – CREATIVITY AND PRODUCT DEVELOPMENT (N)

TIME: 3 HOURS MAXIMUM MARKS:100

PART A

(Answer all the questions, each question carries 2 marks)

1. Briefly describe the systems model of creativity with a sketch?
2. What are platform products and quick-build products? What type of products requires an augmentation of generic process with detailed description of the specific information processing activities required within each phase?
3. Sketch a typical product life cycle showing the variation of sales and profits across various stages? Also, sketch the same for a fad?
4. Distinguish between fundamental versus incidental interactions?
5. What is a product concept? "A new way to solve the in-home training/educational needs of PC users". Is this a concept?
6. What is the impact of DFM on a) Life cycle costs b)Development time
7. What are the major supporting tools of QFD?
8. Translate the following customer statements about a student book bag into proper need statements:
   a) "There's nothing worse than a banana that's been squished by the edge of a textbook"
   b) "When I'm standing in line at the cashier trying to find my checkbook while balancing my bag on my knee, I feel like a stork."
9. Define Value Engineering
10. In technology-intensive businesses, a key product planning decision is when to adopt a new basic technology in a product line".Substantiate this statement by citing a relevant example.

PART B

(Answer any one question from each module. Each question carry 20 marks)

Module-1

1.

a) Discuss the application of TRIZ contradiction matrix? (8)
b) Explain the various types of analogies recognized by Synetics? (8)
c) Explain Kirton's A-I theory? (4)

2.

a) Create a product technology roadmap for a class of products you understand well? (12)
b) Discuss the marketing mix of any of the major players operating in the Confectionery Industry? (4)
c) Explain Ansoff matrix with a practical example? (4)

Module 2

3.

a) Draw a schematic for a wristwatch, using only functional elements (without assuming any particular physical working principles) (8)
b) What are the major subsystems to PLM? (4)
c) Explain any four PLC extension strategies? (4)
d) Explain the various types of Modularity? (4)

4. .

a) Describe the six phases of generic product development process in detail (12)
b) Briefly explain the strategies preferred during a typical PLC? (4)
c) Explain the KANO diagram of customer satisfaction? (4)

Module 3

5.

a) Write in brief about design for safety and mistake proofing (5)
b) Which dimensions of work/workplace are designed for 95 percentile and 5 percentile, respectively? Explain with sketches. What is the percentile applied for door clearance height? (5)
c) Shipments of 300 boxes of glassware are received at a warehouse of a department store. Random samples of five boxes are checked, and the lot is rejected if more than one box reveals breakage. Construct the OC curve for this plan? (10)

6.

a) How geometric programming is utilized to arrive at the dimension of a rectangular box? (8)
b) A strut is subject to a tensile force of P 20 kN. The value of σ_t = 100 N/mm^2. If the material cost is Rs.30/kg and the metal cutting cost per surface is Rs.10/mm^2. Calculate the section dimensions for cost minimization. The strut length is 800 mm. Assume the density of the material as 8000 kg/m^3. (8)

c) Two different products, P1 and P2, can be manufactured by any of the two different machines, M1 and M2. The unit processing time of either product on either machine is the same. The total daily capacity of machine M1 is 200 units, while the total daily capacity of machine M2 is 250 units. The shop supervisor wants to balance the production schedule on the two machines such that the total number of units produced on one machine is within 5 units of the number produced on the other. The profit per unit of P1 is $10 and that of P2 is $15. Set up the problem as an LP in standard form. (4)

Module 4

7.

a) Create a house of quality for the planning of a pencil (10)
b) Discuss the application of QFD in a fast moving consumer goods company such as one which designs and produces personal products –shampoos, toothpaste etc. (5)
c) Illustrate the use of concept combination table (5)

8.

a) Enumerate the seven step process for pursuing a patent? (10)
b) Discuss the major milestones in Indian patent law? (5)
c) What are the essential conditions for the grant of a patent? (5)