

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

Department of Mechanical Engineering

II Semester (2016 - 17) Comprehensive Examination

Course No. : MF F473

Date : 10/05/2017

Course Title: **Product Design and Development**

Marks: **30 (Closed Book)**

Instructions:

- i. Answer all the questions (Marks are mentioned for each question, No partial Marks)
 - ii. Illustrate with sketches, models wherever applicable
 - iii. State the assumptions clearly
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1. Answer the following questions briefly
 - a. What elements will be influenced by creativity methods for improving creativity? How? [1]
 - b. How perceptual and Emotional blocks hinder problem solving [1]
 - c. List and explain multiple ways of concept selection [1]
 - d. List and explain the rules for minimizing costs [1]
 - e. List and explain different types of costs with examples [1]
 - f. How to be an effective member in a team? [1]
 - g. How to have effective interaction with the customer? [1]
 - h. Are Lead users and Extreme users same. Justify with example [1]
 - i. List and explain the factors which needs to be considered in ergonomics [1]
 - j. Briefly explain about two lifecycles of a product [1]
2. List different elements & principle used in aesthetic design. Briefly explain about any two [2]
3. What are the types of models developed in various stages of Industrial Design? How they help? [2]
4. How and when different types of product architectures help in PD? List the parameters which influence architecture decisions [2]
5. List and explain any 6 DFM principles taking examples from daily used items [3]
6. Develop a MET matrix for a paper cup used for hot/cold beverages and use eco-design strategies discussed to improve [4]
7. There are lots of problems people face during the train travel. One of those is escaping from the coach during emergency situations. There are some solutions available currently but are not sufficient or have problems in execution. You are in a company which sells solutions to Railways. Your company is considering to develop solutions to this problem. As a member of Research and Design team, you have been asked to study the problem thoroughly, develop solutions and propose an appropriate solution which can bring business to your company. You need to consider minimum 15 requirements. State the methods used, assumptions made clearly in your answer. You can use any structured method/methods taught in the course. Use sketches wherever possible. [7]