

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
Department of Mechanical Engineering
First Semester (2016- 17) Comprehensive Examination (Regular)

Course Code: DE G531

Date: 05/12/2016

Course Title: **Product Design**

MM: 60 (30%) (Closed Book)

Answer all questions | Draw or Sketch wherever necessary | State your assumptions clearly

1. Roma is opening a new plant and has yet to decide on the type of process to employ. A labor-intensive process would cost ₹10,000 in the first year and ₹20,000 in the second year for tools and equipment and ₹15 for labor and materials per item produced. A more automated process costs ₹50,000 in the first year and ₹25,000 in the second year in plant and equipment but has a labor/material cost of ₹9 per item produced. A fully automated process costs ₹300,000 for plant and equipment and ₹3 per item produced. Interest rate is 8% per year. If process selection were based solely on lowest cost, for what range of production would each process be chosen? [5]
2. Develop a MET matrix for a mobile and use the eco-design strategies to improve [5+5]
3. Identify 10 products each which are bad with respect to manufacturing or assembly and modify them using DFMA guidelines. [5+5]
4. India is facing a great challenge to cope with the needs of elderly population. You are involved with a startup working for providing services. Develop a mission statement and corresponding design drivers with justification. [5+5]
5. You need to observe the status-quo of primary education sector based on your learning from the course and identify five pressing problems each as a) a scholar, b) the government, c) a teacher, d) as a school administrator and e) a supplier. Select 5 most important problems from these with proper justification. Develop opportunity statements for these selected problems. [5+2.5+2.5]
6. You have been selected to work on supporting farmers in developing countries by developing an appropriate Information Technology (IT) enabled system to help them from sow to vend. Approach the situation systematically and propose a system emphasizing the Industrial Design aspects. Note: Minimum 10 requirements, 5 concepts. State the methods used. [15]