



## P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

**Seventh Semester, B.E. - Industrial and Production Engineering**

**Semester End Examination; Dec - 2016/Jan - 2017**

**Product Design and Manufacturing**

*Time: 3 hrs*

*Max. Marks: 100*

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

### UNIT - I

- |      |  |    |
|------|--|----|
| 1 a. | Discuss in detail, effectively explain the essential factors of product design.                  | 10 |
|      | b. With the help of a flow chart, explain feasibility steady phases of Asimow's primary design.  | 10 |
| 2 a. | Explain the role of allowance, process capability and tolerance in detailed design and assembly. | 10 |
|      | b. With a help of a flow chart, explain the detailed design phase involved in primary design.    | 10 |

### UNIT - II

- |      |   |    |
|------|---|----|
| 3 a. | List and explain the different product strategies required for an organization. | 10 |
|      | b. Explain in detail, the concepts of 3's required for product design.          | 10 |
| 4 a. | Explain the basic design considerations in product planning.                    | 10 |
|      | b. Explain the following concepts of product design :                           |    |
|      | i) Strength based design  | 10 |
|      | ii) Impact based design.  |    |

### UNIT - III

- |      |  |    |
|------|--|----|
| 5 a. | Enumerate the aspects considered in design of forging components with simple sketches.         | 10 |
|      | b. Explain with a neat sketch, the design recommendations for pressed components.              | 10 |
| 6 a. | Explain the producibility requirements meant for design of machine parts with simple sketches. | 10 |
|      | b. Explain with a neat sketch, the design considerations of powder metallurgical parts.        | 10 |

### UNIT - IV

- |      |   |    |
|------|---|----|
| 7 a. | Define optimization. Explain Siddal's classification of design approaches.                | 10 |
|      | b. Write a brief note on the following :  |    |
|      | i) Linear Programming   | 10 |
|      | ii) Johnson's method of optimum design.   |    |
| 8 a. | Explain the ten aspects of manufacturing operations that will lower the cost of products. | 10 |
|      | b. Write a brief note on the following :  |    |
|      | i) Design for safety  | 10 |
|      | ii) Design for Reliability.   |    |

**UNIT - V**

- 9 a. Define the term Anthropometry. Explain the importance of Anthropometry as occupant of space with simple sketches. 10
- b. Write a brief note on the following :
- i) Design of controls 10
  - ii) Design of displays.
- 10 a. Explain in detail, the steps involved in value analysis job plan. 10
- b. Define creativity. Explain the different creative techniques for product design. 10

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