



**P.E.S. College of Engineering, Mandya - 571 401**  
*(An Autonomous Institution affiliated to VTU, Belagavi)*  
**Eighth Semester, B.E. - Industrial and Production Engineering**  
**Semester End Examination; July - 2021**  
**Product Design and Manufacturing**

*Time: 3 hrs*

*Max. Marks: 100*

*Note: Answer any FIVE full questions.*

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|---|--|----|
| 1 | a. Define Product Design. List and explain the characteristics of successful product development.            | 10 |
|   | b. Discuss about the steps of detailed design phases with respect to primary design phases and flowcharting. | 10 |
| 2 | a. Explain the role of allowance, process capability and tolerance in detailed design and assembly.          | 10 |
|   | b. Write a note on the following:  |    |
|   | i) Value addition in the production consumption cycle  | 10 |
|   | ii) The challenges of product development  |    |
| 3 | a. Explain the role of 3S's in product design.   | 8  |
|   | b. Explain the procedures adopted by Industrial designers while developing new products.                     | 7  |
|   | c. Discuss about the role of designers.  | 5  |
| 4 | a. With a neat sketch, explain the role of aesthetics in product design.                                     | 8  |
|   | b. Discuss about the role of functional design practice in designing engineering products.                   | 6  |
|   | c. Explain the criteria and objectives of design.  | 6  |
| 5 | a. Explain the factors to be considered while designing press worked sheet metal components.                 | 10 |
|   | b. Discuss about the Principles to be followed while designing casting parts.                                | 10 |
| 6 | a. Explain with a neat sketch, the design recommendations for rubber parts.                                  | 10 |
|   | b. Discuss about the following:  |    |
|   | i) Expanded Metals and Wire Forms  | 10 |
|   | ii) Plastic Gears and Rubber parts   |    |
| 7 | a. Explain Siddal's classification of design approach.   | 8  |
|   | b. Explain the following:  |    |
|   | i) Lagrange Multipliers  |    |
|   | ii) Linear Programming   | 12 |
|   | iii) Geometric Programming   |    |

- 8. Discuss about the following:
  - a) Design for safety
  - b) Design for reliability 20
  - c) Manufacturing operations in relation to design
  - d) Profit volume chart
- 9 a. Define anthropometry. Explain the significance of human being as applicator of forces. 10
- b. Explain the various types of controls and displays used in the industries. 10
- 10 a. Explain the steps of value analysis job plan. 8
- b. Discuss the materials and process selection in value engineering. 12

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