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# 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; May / June - 2019**

**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. Define Product Design. Explain the seven phases of morphology of design. 12
- b. Write a note on following : 8
- i) Value addition                      ii) Production consumption cycle
- 2 a. Explain the characteristics of successful product development. 10
- b. Explain the role of allowance, process capability and tolerance in design and assembly. 10

## UNIT - II

- 3 a. Discuss about the steps involved in the analysis of the product. 12
- b. Explain the steps of basic design considerations. 8
- 4 a. With a neat sketch, explain the role of aesthetics in product design. 10
- b. Write a note on the following : 10
- i) Concurrent design                      ii) Flexible manufacturing systems

## UNIT - III

- 5 a. With a neat sketch, explain the principles involved in forging design. 10
- b. Explain the principles of design for machining ease with a sketch. 10
- 6 a. Explain the design recommendations for rubber parts with neat sketches. 10
- b. Write a note on following : 10
- i) Plastic gears                      ii) Expanded metals and wire forms

## UNIT - IV

- 7 a. Discuss about the various methods proposed by Siddal's for design approaches. 8
- b. Write a note on following : 12
- i) Linear Programming                      ii) Lagrange Multipliers                      iii) Geometric programming
- 8 a. Explain the role of following in product design : 7
- i) Design for safety                      ii) Design for reliability
- b. List the ten aspects of manufacturing operations that will lower the cost of products, if they are considered at design stage. 3
- c. Explain Samuel Eilon model with suitable assumptions. 10

## UNIT - V

- 9 a. Define anthropometry. Discuss the role of human being as applicator of forces. 10
- b. With a neat sketch explain man / machine information exchange. 10
- 10 a. Explain the steps involved in value analysis job plan. 10
- b. Discuss about the following : 10
- i) Material selection parameters                      ii) Brainstorming Techniques

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