

Please check whether you have got the right question paper.

Note

1. **Question No.1. is compulsory**
2. Attempt **any three** questions from the remaining
3. Figures to right indicate full marks
4. Make and state the assumptions clearly wherever required
5. Answers to the same questions should be grouped together
6. Illustrate your answers with neat sketches wherever required

- Q1.** Attempt **any four**:- (20)
- (a) Explain various considerations to be made in design and development of a product.
 - (b) Explain the concept of concurrent engineering and its relevance in product design and development.
 - (c) Explain 'product' and 'product mix'. Give examples. How are products classified?
 - (d) Explain creep behaviour of plastics and its significance in designing plastics products.
 - (e) Briefly discuss product graphics and its significance.
- Q2.**
- (a) Explain the significance of robust design. Enumerate Taguchi's robust design approach with an illustration. (10)
 - (b) Enlist various rapid prototyping tools and their applications. Explain in detail any one of them indicating the capabilities and limitations. (10)
- Q3.**
- (a) Elaborate on the guidelines and methodology employed for design for assembly (DFA). Give a suitable illustration. (10)
 - (b) Discuss briefly about various creativity techniques and their significance in developing products to cater to changing scenario on various fronts. (10)
- Q4.**
- (a) Discuss about the various ergonomic issues you would consider in designing and developing a hand trolley for use in a shopping complex. (10)
 - (b) Explain the principles of value engineering (VE) and its relevance in product design. Explain in detail 'function phase' involved in value engineering job plan. Give examples. (10)
- Q5.**
- (a) With the help of neat design sketches, explain the thumb rules and guidelines for designing the following features on plastics products to be manufactured by injection moulding process. (12)
 - I. Hinges and snap fits.
 - II. Internal and external threads.
 - III. Wall thickness and rims.
 - IV. Bosses and ribs
 - (b) Briefly discuss about computer aided design approaches and their relevance in product design and development. Give examples. (8)
- Q6.** Write explanatory notes on:- (**any four**) (20)
- a) Material selection process.
 - b) Product aesthetics.
 - c) Sustainable design.
 - d) Conceptual design.
 - e) Designing for reliability and safety.
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