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D 4233

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Eighth Semester

Mechanical Engineering

ME 1017 — PRODUCT DESIGN AND COSTING

(Common to Mechatronics Engineering)

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Name the three key functions of product development project.
2. What are the three major blocks that can inhibit creative thinking?
3. List out four general criteria for material selection.
4. What is meant by material first approach?
5. What is meant by proof of concept model?
6. State true or false. Justify your answer. "Kinematic similarity is based on the time proportionality between corresponding events in the model and the prototype".
7. What is meant by recurring and non recurring cost?
8. What is cost index?
9. Write short note on intelligent information system.
10. What is continuum and structural element in FEA?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Briefly explain the factors to be assessed to evaluate the performance of product development effort. (10)
- (ii) What role does market research play in the product development process. (6)

Or

- (b) (i) Explain the principles of creativity in product design with examples. (8)
- (ii) Briefly explain possible design approaches for manufacturability. (8)
12. (a) (i) Classify the most commonly used materials in the order of their importance to the industrial designer. (8)
- (ii) Compare the economics of two alternative process for a consumer product and indicate possible basis of choice when two kinds of material satisfy the specification. (8)

Or

- (b) How to relate modularity and mass customization to economics of design? Explain six types of modularity for the mass customization. (16)
13. (a) (i) Discuss the importance of material selection in model studies and show how a set of variables can be rationalized to relate model performance and expected behavior of a component. (8)
- (ii) Give some examples of common conceptual model. (8)

Or

- (b) (i) Explain about the role and basic requirements of process chain. (8)
- (ii) Discuss some fundamental issues in product modeling. (8)
14. (a) Explain with a flow chart, the procedures for developing parameteric cost estimating system for the conceptual design stage. (16)

Or

- (b) (i) What is standard time? Explain how it is arrived for a process? (8)
- (ii) Make a brief note on work in process costing. (8)

15. (a) (i) Explain two ways of FEA software approaches to ensure accuracy of the model by convergence of error. (8)
- (ii) Explain the issues in product life cycle management. (8)

Or

- (b) Briefly discuss about the concept of knowledge based product and process design. (16)
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