Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 51090

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023

Fifth/Seventh Semester

Aeronautical Engineering

OMF 551 – PRODUCT DESIGN AND DEVELOPMENT

(Common to: Aerospace Engineering/Agriculture Engineering/
Automobile Engineering/Biomedical Engineering/Computer Science and
Engineering/Computer and Communication Engineering/Electrical and Electronics
Engineering/Electronics and Communication Engineering/Electronics and
Instrumentation Engineering/Electronics and Telecommunication
Engineering/Industrial Engineering/Industrial Engineering and
Management/Instrumentation and Control Engineering/
Marine Engineering/Material Science and Engineering/
Mechanical Engineering/Mechanical Engineering(Sandwich)/
Mechatronics Engineering/Medical Electronics/Production Engineering/Robotics and
Automation/Safety and Fire Engineering/Artificial Intelligence and Data Science/
Bio Technology/Biotechnology and Biochemical Engineering/Computer Science and
Business Systems/Fashion Technology/Food Technology/Handloom and Textile
Technology/Information Technology/Pharmaceutical Technology/
Plastic Technology/Polymer Technology/Textile Chemistry/Textile Technology)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by integration of customers?

2. List out the various needs of IPPD.

3. Define concept scoring.

4. What are Bench mark and Team work?

5. List out the various types of modularity.

6. Define product variety.

7. State importance of industrial design.

8. Express the function of cost management.

9. List out the different prototype techniques.

10. What is meant by component cost?.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain the different phases of generic product development process and point out the tasks and responsibilities in the organization. (8)

(ii) Discuss the methodology used for development of new products. (5)

Or

(b) (i) Discuss the role of competitive bench marking in planning. (5)

(ii) Explain the characteristics of successful product development. And also discuss challenges in new product development. (8)

12. (a) (i) Discuss about the measurement technique in Concept selection. And also explain the problem clarification for concept generation. (7)

(ii) Explain the different steps to measure a customer response. (6)

Or

(b) (i) Describe the activities of concept generation in a cordless electric system take any one example. (6)

(ii) Explain the methods for choosing survey population and various survey formats. (7)

13. (a) (i) Describe the need for chunks in product architecture. (7)

(ii) Explain the types of modularity with example. (6)

Or

(b) (i) Describe the implications of architecture in product development. (6)

(ii) Explain the importance of component standardization. (7)

14. (a) (i) How industrial design establishes a corporate identity for market needs? And also explain control drawings or model used in Industrial Design. (7)

(ii) Explain about the Impact of Computer-Based Tools on Industrial design Process. (6)

Or

(b) (i) Discuss and compare the assessment of Industrial Design quality with continuous control systems. (7)

(ii) Explain about refinement and final concept selection in ID process. (6)

15. (a) (i) How would you use the quantitative analysis method to capture the economic performance of an entire line of products to be developed and introduced over several years. (5)

(ii) Explain the following terms briefly:

(1) Economic analysis in product design. (4)

(2) Project execution. (4)

Or

(b) (i) Describe in detail about the Design for manufacturing process, with suitable example and its importance. (6)

(ii) Explain the basic principles used in prototype design and also discuss prototyping technologies. (7)

PART C — (1 × 15 = 15 marks)

16. (a) Summarize the reasons why reducing the number of parts in a product might reduce production costs. Also explain some reasons why costs might increase.

Or

(b) Under what conditions might efforts to accelerate a product development project also lead to increased product quality and/or decreased product manufacturing costs? Under what conditions might these attributes of the product deteriorate when the project is accelerated?

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