

B.TECH/ME/5TH SEM/MECH 3144/2018
NEW PRODUCT DEVELOPMENT
(MECH 3144)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

***Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.***

***Candidates are required to give answer in their own words as far as
practicable.***

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

- (i) The process of transforming the product functions to product form is called
(a) Product specification (b) Product benchmarking
(c) Product prototype (d) Product architecture.
- (ii) Moore's law states that innovation in computing technology
(a) remains constant (b) increases at a constant rate
(c) accelerates (d) tops out (decelerate).
- (iii) During concept generation and brain storming process
(a) Too many ideas should not be generated to avoid confusion
(b) Only those ideas that seem feasible should be considered
(c) The discussion should be completed within a predetermined fixed time.
(d) None of the above.
- (iv) Portfolio planning is a subject of
(a) Understanding opportunity (b) Development of a concept
(c) Implementation of a concept (d) Embodiment engineering.
- (v) Reverse engineering of a product involves
(a) Engineering a product by following the steps in reverse
(b) Designing a product which is reverse of an existing product
(c) Extracting information from an existing product
(d) Designing a product from fundamental.
- (vi) Patent right of a product is a
(a) Ethical matter (b) Legal issue
(c) Design consideration (d) Customer obligation.

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- (vii) FAST is a method used for finding
(a) product function (b) customer needs
(c) product assembly steps (d) Project facilities.
- (viii) Concurrent Engineering means
(a) Latest Design (b) Concept to manufacture
(c) Product modelling (d) Doing design & manufacturing together.
- (ix) Comparing a company's product's specification, durability and maintainability with that of competitor's is called
(a) Quality function deployment (b) Prototype testing
(c) Market survey (d) Benchmarking.
- (x) Which of the following can be categorised as "Design for Assembly" guideline?
(a) Minimize part count (b) Maximise part symmetry
(c) Provide alignment features (d) all of the above

Group – B

2. (a) What is the importance of Product Development?
(b) What are the major activities in the Product Development process?
6 + 6 = 12
3. (a) List and elaborate 2(two) major ethical issues of product development?
(b) What are the differences between "integrated team" and "sequential functional team" for product development?
(c) How is product development different from product design?
4 + 4 + 4 = 12

Group – C

4. (a) What is S-curve and what does it say about the status of a product in the market?
(b) How the cost of a project and its "Return on Investment" are arrived at?
5 + 7 = 12
5. (a) List and briefly elaborate the types of customer needs.
(b) Briefly describe the steps of FAST method.
6 + 6 = 12

Group – D

6. (a) What are the differences between Modular and Integral Architecture?
(b) Write short notes on the following steps of Modular design by Clustering Method for a Deskjet Printer:
i) Create a function structure of the product
ii) Cluster the sub-functions into modular chunks
iii) Create a rough geometric module
3 + (3 + 3 + 3) = 12

7. (a) Elaborate the guidelines of an effective Brain storming process.
- (b) With the help of a cost tree show how to arrive at the final product cost
- (c) How do you arrive at the manufacturing cost of a single component and assembly cost of components? Explain using a cost table.

$$5 + 3 + 4 = 12$$

Group – E

8. (a) Write short notes on at least 3 (three) types of Prototype models?
- (b) What are the advantages and disadvantages of
(i) Analytical Model? & (ii) Physical Model?
9. (a) What issues are addressed by “Failure Mode & Effect Analysis”? List 4 (four) potential failures of a product.
- (b) Write down the objectives of “Design for Manufacture” and “Design for Assembly”.

$$6 + (3 + 3) = 12$$

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