

**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: $10 \times 1 = 10$
- (i) Concurrent Engineering means
(a) latest Design
(b) concept to manufacture
(c) product modelling
(d) doing design & manufacturing together.
- (ii) What characteristic is represented by letter 'R' of PRIDE principle?
(a) reason (b) respect (c) robust (d) right.
- (iii) Patent right of a product is a
(a) ethical matter (b) legal issue
(c) design consideration (d) customer obligation.
- (iv) Disruptive technology signifies
(a) wartime technology (b) unusual technology
(c) incompetitive technology (d) new era of technology.
- (v) The process of the transforming the product functions to product form is called
(a) product benchmarking (b) product specification
(c) product architecture (d) product prototype.
- (vi) In order to make a product more difficult for copying by competitors, the product should have
(a) modular architecture (b) integral architecture
(c) mixed architecture (d) can have any architecture.

- (vii) During brain storming process which of the following guideline should be followed?
(a) Only feasible idea that seems feasible should be considered
(b) Too many ideas should not be generated to avoid confusion.
(c) The discussion session should be completed within a predetermined time.
(d) None of the above.
- (viii) 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.
- (ix) The first full scale functional prototype of a product, constructed from actual materials as the final product is called
(a) Alpha prototype (b) Beta prototype
(c) Gama prototype (d) DOE prototype.
- (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 role of R & D in product development?
(b) Compare between original design and adaptive design?
(c) What do you understand by embodiment engineering?
 $2 + 6 + 4 = 12$
3. (a) What is the advantage of "integrated team" over "sequential functional team" for product development?
(b) What are the two major ethical issues of product development?
(c) Explain through a diagram evolution of a technology.
(d) What is technology strategy of a company developing a new product?
 $2 + 2 + 6 + 2 = 12$

Group – C

4. (a) What is product portfolio?

- (b) Why product platform planning is important?
- (c) What are the competitive strategies of a company?

4 + 4 + 4 = 12

5. (a) What are the methods normally employed in finding out customer needs?
- (b) Briefly describe the steps of FAST method.

6 + 6 = 12

Group - D

6. (a) What is meant by 'Product architecture' and what does it seek to achieve?
- (b) Write at least 4 characteristics of Integral Product Architecture
- (c) Write at least 4 types of function based modularity with examples.

4 + 4 + 4 = 12

7. Define the 4 steps of Clustering Method of modular design with reference to a desktop inject printer.

12

Group - E

8. (a) Write seven steps, with short explanation, of an effective benchmarking process.
- (b) List what should be the contents of a good product specification.

8 + 4 = 12

9. (a) What is the objective of "Design for Manufacture" and "Design for Assembly"
- (b) Give six DFA guidelines with short explanation and relevant sketches.

(3 + 3) + 6 = 12