

**NEW PRODUCT DEVELOPMENT
(MECH 3223)**

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) Competitive Analysis is carried out for
 - (a) launching a new product before the competitor does
 - (b) Product functional modelling
 - (c) customer need analysis
 - (d) understanding the capability of competitors.
 - (ii) One of the important legal issues to be taken care of subsequent to a new product development is
 - (a) Customer feedback
 - (b) Patent right
 - (c) Design consideration
 - (d) Product profitability.
 - (iii) If a product is designed based on modular architecture, then
 - (a) product can become integral part of another product
 - (b) change of product design in future becomes easy
 - (c) copying the product by competitor becomes difficult
 - (d) None of the above.
 - (iv) Analytical Modelling for simulation of a product has the following characteristics.
 - (a) Performance is predicted accurately
 - (b) Can be completed in relatively short time
 - (c) It is expensive
 - (d) Any change in the product cannot be analysed easily
 - (v) The first full scale functional prototype of a product, constructed from actual materials as the final product is called
 - (a) Test model prototype
 - (b) Beta prototype
 - (c) Alpha prototype
 - (d) DOE prototype

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- (vi) Parameters that may be benchmarked for a product are
(a) Availability (b) Performance
(c) Environment friendliness (d) All of above.
- (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) Components of a product designed following the guidelines of DFA will be
(a) Easy to manufacture (b) Easy to sell
(c) Easy to assemble (d) Easy to maintain.
- (x) What the last letter of "PRIDE" principle stands for?
(a) Excellence (b) Enterprise (c) Energy (d) Eagerness.

Group - B

2. (a) Elaborate the activities under the following product development processes:
Understand the opportunity
(b) Develop a concept
(c) Implement a concept.
 $4 + 4 + 4 = 12$
3. (a) What team structures are considered for Product Development Team? Explain briefly.
(b) Name and elaborate the 5 steps of 'product development planning'.
(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) What are the methods normally employed in finding out customer needs?
(b) Explain what FAST method is and what its steps are.
 $6 + 6 = 12$

Group - D

6. (a) Write at least 2 types of Function based modularity with examples.
(b) Present the following for Modular design of a Deskjet Printer by Clustering Method. Use a sketch to elaborate it.
(i) Cluster the sub-functions into modular chunks

6 + 6 = 12

7. (a) In the context of new product development, outline the goal and steps of concept generation process.
(b) What are the cost items that go into manufacturing a component? Out of those, identify which are 'Over head' costs.
(c) Arrive at the final selling price of a product (which has 3 components) using a cost table.

4 + 4 + 4 = 12

Group - E

8. (a) What are the uses of a prototype? Describe the characteristics of Beta and Preproduction prototypes
(b) What are the merits and demerits of analytical model and physical model for simulating a product's performance?

6 + 6 = 12

9. (a) What are the guidelines of Design for Assembly of a product? Explain with suitable examples and sketches.
(b) What is 'Benchmarking' and what are its benefits?
(c) What are the three (3) things "Failure Mode & Effect Analysis" does for a product? List 4 (four) potential causes of failures of a product and their potential effects.

4 + 4 + 4 = 12

Department & Section	Submission Link
ME	https://classroom.google.com/c/MzAwMzU2MDQwMTE3/a/MzY0NTQ0ODk2OTA0/details