

**M.E. Mech (P.D.D. Engg.)**  
**Master Of Engineering**  
**Question Papers May - June 2018**  
**Sem – I & II**





R-2016

(Time: 3 hrs)

[Total marks: 80]

- N.B 1) Solve any four questions.  
2) Assume suitable data if necessary.  
3) Figures to the right indicate full marks.

- Q.1 a Explain morphology of design. 10  
b Explain design of experiment and robust design 10  
Q.2 a Classify the products. What means product specification? 10  
b How concurrent engineering aids in product development process 10  
Q.3 a What are concept selection methods used to benchmark or evaluate existing products? Explain such evaluation with suitable examples 10  
b What is Anthropometry? Discuss with suitable illustration 10  
Q.4 a Explain elements of manufacturing cost of product. 10  
b Explain Psychological & Physiological considerations in ergonomics and aesthetics in product design. 10  
Q.5 a Explain the steps involved in Design For Manufacturing Process with illustration 10  
b Discuss concept, types, and use of rapid prototyping in product development process 10  
Q.6 Write short notes 20  
a Intellectual property  
b Value engineering  
c Product architecture  
d Design for Manufacturing





(3 Hours)

(Marks:80)

- N.B. : (1) Answer any four questions out of the six questions.  
 (2) Figures to the right indicate full marks.  
 (3) Illustrate answers with neat sketches where ever required.  
 (4) Answers to the questions should be grouped and written together.  
 (5) Assume suitable data if required.

1. (a) Delineate Quality Function Deployment and its methodology followed in the product development. 10
- (b) Illuminate Kano model with suitable example. 10
2. (a) What is FMEA? Explain the terminology used and their position in FMEA block diagram. 10
- (b) Discuss FMEA procedure with suitable example. 10
3. (a) Define Design Of Experiments. Describe procedure to carry out DOE for the Design and development of new product. 10
- (b) Explain the steps followed in ANOVA. 10
4. (a) Illustrate- Pareto diagrams, Run charts and Box plots. 10
- (b) Elucidate Scatter diagrams, Multivariable charts, Matrix plots and 3-D plots in context of statistical process control. 10
5. (a) Explain Weibull Distribution in the reference of reliability. 10
- (b) Explain the terms MTBF, MTBM, MTTR, MDT and maintainability with suitable example. 10
6. (a) Explicate Six Sigma DMAIC Methodology. 10
- (b) Describe Design for Six Sigma (DFSS) Phases. 10



~~$8 + 10 = 18$~~



(Duration: 3 hrs)

[Total marks: 80]

17/05/18

N.B

- 1) Answer any four questions
- 2) All questions carry equal marks.
- 3) Illustrate answers with neat sketches where ever required.

- Q.1 a Discuss the factors needs to be considered while selecting manufacturing process 10
- b State and illustrate various guidelines for DFM 10
- Q.2 a Discuss various geometric tolerances 10
- b Explain benefits of part standardization DFMA 10
- Q.3 a Explain with illustration any five reasons of poor value. 10
- b Explain basic kinds of values. 10
- Q.4 a Explain steps of value analysis 10
- b Explain MTTR with illustration. 10
- Q.5 a State and explain Reliability, and Maintainability. 10
- b Explain bath tub curve and its significance 10
- Q.6 a State and explain cost comparison methods for quantitative economic analysis. 10
- b Proposals of two equipment X and Y are considered for certain purpose. Each equipment has an economic life of 6-years. Equipment X would generate annual cash flow of Rs.20,000/- and would cost Rs.60,000/-, with scrap value at the end of life would be Rs.8,000/-. Equipment Y will generate annual cash flows of Rs.52,000/- and would cost Rs.1,50,000/-, with scrap value at end of life years is expected to be Rs,35,000/-. Evaluate the preference of two equipment using ARR and NPV methods. Assume rate of return 12%. 10





21/05/18

(3 Hours)

- N.B. : (1) Answer any four questions out of the six questions.  
(2) Figures to the right indicate full marks.  
(3) Illustrate answers with neat sketches where ever required.  
(4) Answers to the questions should be grouped and written together.  
(5) Assume suitable data if required.

1. (a) What is ergonomics? What are the objectives and benefits of studying it? 10  
(b) Explain auditory sensory system in detail. 10
2. (a) What do you understand by controls? Explain different types of control with neat sketches. 10  
(b) How the brain does decision making. What is explicit and implicit memory? 10
3. (a) What is Musculoskeletal Disorders.? What is the role of ergonomics in reducing it. 10  
(b) Explain in details common workplace postures and movements. 10
4. (a) Who are the users? Why it is necessary to understand them for design purpose? 10  
(b) What is interface? Explain and list any ten interfaces. 10
5. (a) What is the role in Ergonomics in product design? 10  
(b) List the various movement of the body and explain how the body follows the principles of lever. 10
6. (a) What are the basic elements of design? Explain any five in detail. 10  
(b) What are the GESTALT laws? Explain them with suitable examples. 10





(3 Hours)

[Total Marks:80]

- N.B. : (1) Attempt any **FOUR** Questions.  
(2) Figures to the right indicate full marks.  
(3) Furnish neat sketches whenever necessary.  
(4) Assume any suitable data if required.

23/05/18

1. (a) Define Marketing? What is marketing environment? Explain internal and external environment ? 10  
(b) Define Pricing? Discuss the various method of pricing? 10
2. (a) Explain in detail Exploratory Research, Descriptive Research and Experimental Research? 10  
(b) Discuss the role and importance of Distribution network in Supply Chain Management? 10
3. (a) Examine your decision making process in case you are purchasing a laptop? 10  
(b) Describe in detail designing & planning transportation network in Supply Chain Network? 10
4. (a) What are the different stages of marketing research Process? 10  
(b) Explain Cost based, Price based and Customer based brand equity? 10
5. (a) What is meant by Brand Positioning? Explain the steps involved in the process of brand positioning? 10  
(b) Describe the Nature and Importance of CB? What are application of CB in Marketing? 10
6. Short Note on:-
  - (a) Secondary Data Sources for Marketing Research in India. 20
  - (b) Price Discriminations?
  - (c) Marketing mix
  - (d) Supply Chain Network





(3 hours)

[Total Marks-80]

- N.B. (1) Attempt any four questions out of six questions  
(2) Assume any additional data if necessary and state it clearly  
(3) Explain answers with neat sketches wherever necessary

25/05/18

- 1 a) How Principle Research method different from Methodology? Give example to justify the difference. [10]  
b) Show the classification of research characteristics and discuss at least two classified characteristics with suitable example. [10]
- 2 a) Are quantitative and qualitative research types inter-related with each other? Justify your answer. [10]  
b) What are the methods for analyzing data in quantitative research? [10]
- 3 a) Show the significance of Sample design and describe essential steps to achieve good sampling design. [10]  
b) A car manufacturer claims that his cars will run for an average of 20,000 miles before needing their first repair. To prove this claim, you have tracked a test where you took random sample of 21 cars. It found that the sample average number of miles before repair was 18,700, with a standard deviation of 8,600 miles. If you have been asked to draw the random sample test analysis for this manufacturer what significant test limitations you can suggest or recommend to manufacturer while taking random sample of cars? [10]
- 4 a) There are various stages of scientific research process. Suppose you will have the opportunity to learn how to negotiate solutions to open engineering design problem using systematic design methods. What stages of scientific research process you will follow? Briefly discuss every stage that you like to consider. [10]  
b) What is the characteristic of Good Hypothesis? Explain type I and II errors, level of significance and variables in hypothesis. [10]
- 5 a) Identify any research area you are interested in. What procedural steps you will follow to formulate any research problem in this research area. Be specific to steps you follow and provide relevant description. [10]  
b) Summarize the difference between qualitative and quantitative two data collection methods. [10]
- 6 a) Discuss the validity of research thoroughly. [10]  
b) "Ethics in research is the need of the hour". Justify the statement. [10]



17.5 (1000) / Jan. 17 / Class Time / Lecture II Research  
O.P. Code 2474

22/1/18

8.

80