

**B.Tech. MECHANICAL ENGINEERING
(BTMEVI)**

Term-End Examination

June, 2013

00980

BIMEE-010 : MECHANICAL SYSTEM DESIGN

Time : 3 hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks. Use of scientific calculator is allowed.

1. (a) Discuss the factors that have prompted the development and rapid deployment of concurrent engineering in Industries. 7+7
(b) Explain how would you develop the design specifications of a product for inclusion in needs statement.

2. (a) List and explain the major models used in system analysis/design. 7+7
(b) Briefly explain what is meant by iconic, analog mathematical and stimulation models. What are the advantages of using models in engineering design and analysis ?

3. (a) You have to develop a simulation model for the study of an assembly line in an automobile company. Describe how would you develop the simulation model for this purpose. **7+7**
- (b) Explain with the help of suitable examples the methodology of system analysis based on black - box approach. Illustrate your answer with reference to a Manufacturing company.
4. (a) Discuss various approaches and techniques used in concurrent engineering. **7+7**
- (b) Give a list of optimization techniques used for the analysis of the system. Describe any one technique in brief.
5. (a) Discuss the need of modelling for studying a system. How does it help in solving a problem ? **7+7**
- (b) Why financial analysis is made for evaluation of a system ? How is it useful in designing of system ?
6. ABC Machine Tools Pvt limited is currently working with a process which after paying for materials, labour etc., brings a profit of Rs. 12 000. The following alternatives are made available to the company. **14**

- (a) The company can conduct Research (R_1) which is expected to cost Rs. 10,000 having 90% chances of success. If it proves a success the company gets a gross income of Rs. 25,000.
- (b) The company can conduct research (R_2) which is expected to cost Rs. 8,000 having a probability of 60% success, the gross income will be Rs. 25,000.
- (c) The company can pay Rs. 6 000 as royalty for a new process which will bring a gross income of Rs. 20, 000.
- (d) The company continues the current process. Because of limited resources, it is assumed that only one of the two types of research can be carried out at a time. Use decision tree analysis to locate the optimum strategy for the company.

7. Write short notes on **any four** of the following :

- (a) Planning Horizon
- (b) Time value of money
- (c) Feasibility assessment
- (d) Expected Monetary Value
- (e) Probability density function
- (f) Utility value

$3\frac{1}{2} \times 4 = 14$