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BIMEE-010

B.Tech. – VIEP – MECHANICAL ENGINEERING (BTMEVI)

Term-End Examination

00284

December, 2016

BIMEE-010 : MECHANICAL SYSTEM DESIGN

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **five** questions. All questions carry equal marks.*

1. (a) Briefly describe different approaches and techniques used in concurrent engineering. 7

(b) Define the term 'engineering system'. What are the different types of engineering systems ? Briefly explain the overall design process with the help of a block diagram. 7

2. (a) Explain the importance of optimization in a network model used in an assembly line of an automobile company. 7

(b) Describe the following : 7

(i) Analytical methods of optimization

(ii) Combinational optimization

3. (a) What is the importance of understanding the problem environment ? Discuss the hierarchical nature of engineering problem. 7

(b) Briefly explain how a mathematical model is formulated for a compound bar system. 7

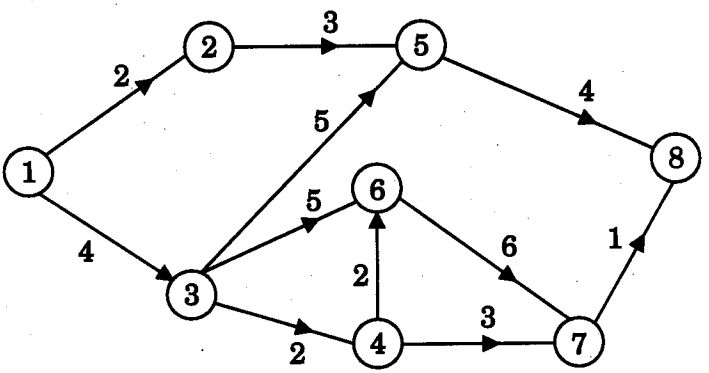
4. (a) Explain how you would develop the design specifications of a product for inclusion in need assessment. 7

(b) What is the significance of black box approach in system analysis ? Explain the general methodology for carrying out system analysis. 7

5. (a) What is the importance of probability in Decision Analysis ? Explain Bayes' theorem and give its applications. 7

(b) What are the limitations of simulation approach ? How can computers be used for the purpose of simulating a system ? Explain. 7

6. What are the components of a typical network ? For the network shown below, determine the shortest and longest path between node 1 and node 8. The numbers written immediately above the arrows represent the arc length. *14*



7. Write short notes on the following : $4 \times 3\frac{1}{2} = 14$

(a) Utility Value

(b) Probability Density Function

(c) Time Value of Money

(d) Planning Horizon