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BIMEE-010

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

Term-End Examination

December, 2015

BIMEE-010 : MECHANICAL SYSTEM DESIGN

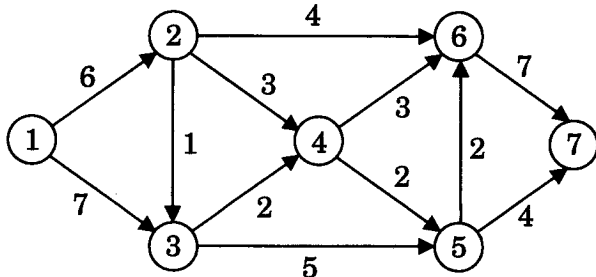
Time : 3 hours

Maximum Marks : 70

Note : Answer any *five* questions. All questions carry equal marks. Use of scientific calculator is permitted. Assume missing data, if any.

1. (a) What are the objectives of an optimization process ? List the various techniques of multi-performance optimization. Explain any one in brief.
- (b) Describe the various approaches and techniques used in concurrent engineering. 7+7
2. (a) Explain with the help of a suitable example, the difference between an Iconic model and an Analog model of a system.
- (b) Why is financial analysis made for evaluation of a system ? How is it useful in designing of a system ? 7+7

3. (a) Explain Bayes' theorem and discuss its application.
- (b) Describe the advantages and limitations of simulation approach. 7+7
4. (a) Explain Black-box approach for system analysis with a suitable example.
- (b) What are the elements of a decision problem ? Explain the method of taking decision under uncertainty with a suitable example. 7+7
5. (a) What are the different types of Engineering systems ? Explain the four essential attributes in defining a system.
- (b) Describe the procedure for formulating a mathematical model of an optimization problem, with a suitable example. 7+7
6. (a) Determine the maximum flow using a suitable algorithm, for the given network :



- (b) Find the minimum value of x in the function :

$$f(x) = 2x^3 - 3x^2 + 1.$$

Plot the function $f(x)$ on a graph. 7+7

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

- (a) Time Value of Money
 - (b) Feasibility Assessment
 - (c) Utility Value
 - (d) Probability Density Function
 - (e) Planning Horizon
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