



Printed Pages : 4

TME - 802

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0481

Roll No.

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B. Tech.

(SEM. VIII) EXAMINATION, 2007-08

MECHANICAL SYSTEM DESIGN

Time : 3 Hours]

[Total Marks : 100

- Notes :
- (1) Attempt all questions.
 - (2) All questions carry equal marks.
 - (3) Be precise in your answer.
 - (4) No second answer book will be provided.

1 Attempt any **two** parts of the following : **10x2=20**

- (a) Discuss the attributes characterizing the system. Explain with suitable examples the types of system.
- (b) Explain the basic concept of concurrent engineering with proper example. Describe with suitable example, the basic steps to be followed in concurrent engineering.
- (c) Briefly discuss the advantages of system approach.



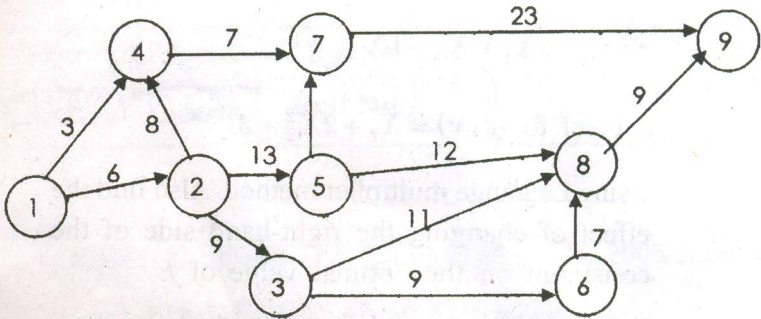
2 Attempt any **two** parts of the following : **10x2=20**

- (a) (i) How will you analyze a Mechanical System? Explain with example.
- (ii) Explain the component integration approach for the analysis of the system.
- (b) What is the role of models in engineering design? Define the following category of model in some detail
- (i) Experimental model
- (ii) Prototype model.
- (c) Explain the following with respect to compound bar system :
- (1) Compound behaviour
- (2) Compound capability
- (3) System equilibrium
- (4) System constraints.

3 Attempt any **two** parts of the following : **10x2=20**

- (a) Find the shortest and longest path from node 1 to 9 of the network as shown in figure below. The values denote length.





- (b) Explain the various ingredients of decision problem. What are the basic steps of a decision process ?
- (c) What are the characteristics/features of material handling system ? Briefly explain the material handling system.

4 Attempt any **two** parts of the following : **10x2=20**

- (a) What do you understand by the feasibility assessment with regards to system evaluation? Explain briefly
- (1) present worth method
 - (2) Pay back period method in context to time value.



- (b) Find the maximum of the following function :

$$f(x) = 2X_1 + X_2 + 10$$

$$\text{subject to } g(x) = X_1 + 2X_2^2 - 3$$

Using Lagrange multiplier method. Also find the effect of changing the right-hand side of the constraint on the optimal value of f .

- (c) With neat sketch, explain the insulation system. Derive the critical thickness of insulation of sphere.

5 Write short notes on any **two** : **10x2=20**

- (a) Role of computer in simulation
- (b) Model of inventory control system in production plant
- (c) Basic steps in the installation of machinery.

