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Printed Pages : 4

TME – 802

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

PAPER ID : 0481 Roll No. | | | | | | | | | | |

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.

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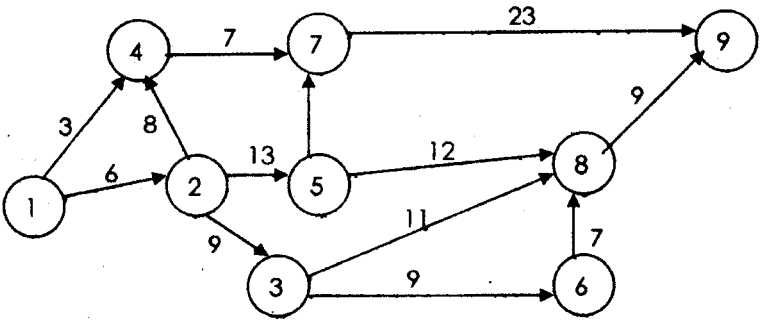

(b) Explain the various ingredients of decision probelm. What are the basic steps of a decision process ?

(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 :

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

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.
