



Paper ID : 250137

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Subject Code: KOE096

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BTECH
(SEM VIII) THEORY EXAMINATION 2024-25
MODELING AND SIMULATION OF DYNAMICS SYSTEMS

TIME: 3 HRS**M.MARKS: 100****Note:** Attempt all Sections. In case of any missing data; choose suitably.**SECTION A****1. Attempt all questions in brief.****2 x 10 = 20**

Q No.	Question	CO	Level
a.	Define modeling. What is its role in system analysis and design?	1	2
b.	Explain the concept of simulation.	1	2
c.	Describe pneumatic systems and their functionality.	2	2
d.	Explain Bond graph of modeling of dynamic system	2	2
e.	Define rotary system.	3	1
f.	Define linearity and non-linearity.	3	1
g.	What is a system transfer function? Explain its purpose and use.	4	2
h.	Define bode plot with example.	4	1
i.	Define optimization.	5	1
j.	Explain planner mechanisms in Simulation.	5	2

SECTION B**2. Attempt any three of the following:****10 x 3 = 30**

Q No.	Question	CO	Level
a.	Discuss the system models of electro mechanical systems.	3	2
b.	What do you mean by bond graph modeling? Discuss it in detail using an appropriate example of a mechanical system.	2	3
c.	Explain each step involved in simulating a compound pendulum using SIMULINK.	5	3
d.	Discuss the advantages and limitations of using MATLAB as a simulation tool for dynamic systems.	1	4
e.	Draw the Bode Plot for the transfer function $G(s)$. $G(s) = \frac{25}{s^2 + 4s + 25}$ From the bode plot determine- (i) Gain Margin (ii) Phase Margin	4	3

SECTION C**3. Attempt any one part of the following:****10 x 1 = 10**

Q No.	Question	CO	Level
a.	Describe MATLAB and its use as a simulation tool.	1	2
b.	Discuss modelling of dynamic system in detail.	1	2



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TIME: 3 HRS**M.MARKS: 100****4. Attempt any one part of the following:****10 x 1 = 10**

Q No.	Question	CO	Level
a.	Explain the hydraulic systems in detail.	2	2
b.	Describe the method of drawing bond graph model for mechanical systems.	2	2

5. Attempt any one part of the following:**10 x 1 = 10**

Q No.	Question	CO	Level
a.	Discuss the modelling of combined rotary and translatory system.	3	2
b.	Explain hydro mechanical system in detail.	3	2

6. Attempt any one part of the following:**10 x 1 = 10**

Q No.	Question	CO	Level
a.	What do you mean by signal flow diagram? What are the various symbols used in signal flow diagram? Explain with an example.	4	3
b.	Discuss the dynamic response of first order system and second order system.	4	2

7. Attempt any one part of the following:**10 x 1 = 10**

Q No.	Question	CO	Level
a.	How is verification and validation of simulation model done? Explain in detail.	5	2
b.	Define optimization and discuss its significance in the analysis and performance improvement of systems.	5	1