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| Class: **III/IV B.Tech** | **I Mid-term Examinations** | Date :28/11/2020 |
| Branch: **ECE** | **LINEAR CONTROL SYSTEMS** | Time :**90 Min** |
| Sub Code: **EC-311** |  | Max. Marks :**18** |

**SECTION-A**

**Answer All Questions: (6 x 1 = 6M)**

1. a) Define system, control system. **(Remember)**

b) Distinguish between linear and nonlinear control system. **(Analyze)**

c) State disadvantages and advantages of signal flow graph. **(Remember)**

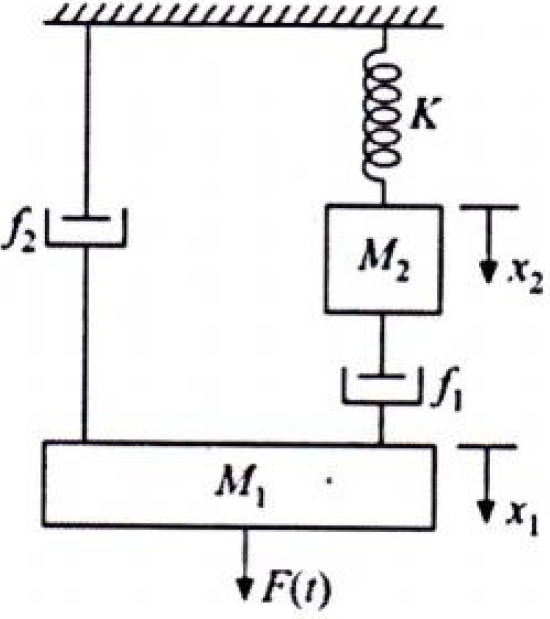
d) What are the standard test signals? **(Understand)**

e) Define the term rise time, settling time. **(Remember)**

f) Define steady state response and steady error. **(Remember)**

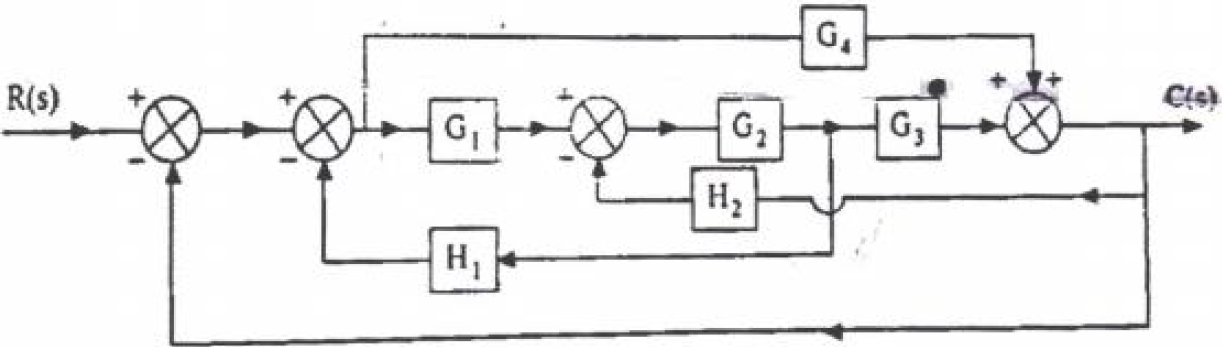
**SECTION-B (1x 6 = 6M)**

1. Write the differential equations for mechanical system shown in figure and obtain an analogous electrical circuit in force-voltage analogy. (**Apply)**



**(OR)**

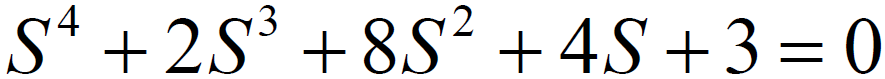
1. Draw the signal flow graph and derive the transfer function of the system using mason’s gain formula. **(Apply)**



**SECTION-C (1 x 6 = 6M)**

1. Write the expression for time domain specification of a second order control system and indicate with neat sketch? Also how damping ratio affect the time response of second order system. **(Remember)**

**(OR)**

1. Determine the stability of system represented by the characteristic equation  by means of Routh criterion. **(Apply)**