**18EE502**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **February, 2021** | **Electrical & Electronics Engineering** | | |
| **Fifth Semester** | **Control Systems** | | |
| **Time:** Three Hours | | **Maximum :** 50 Marks | |
| *Answer Question No.1 compulsorily.* | | | (1X10 = 10 Marks) |
| *Answer ANY FOUR questions from Question Nos.2 to 9.* | | | (4X10=40 Marks) |

I. Answer all questions

a) What are the advantages of Closed Loop System?

b) Write any two applications for feedback control system

c) Write Monson’s Gain Formulae?

d) What are the standard test signals used in the analysis of control systems?

e) What is difference between type number and order of the system?

f) What is the effect of adding zero to a system?

g) Define BIBO stability of a system.

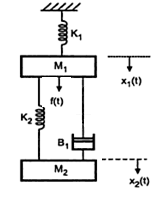
h) What are the limitations of RH stability criterion?

i) Draw the polar plot for type 1 and order 2 system

j) What is meant by Observability of the system?

2.a) Write any four differences between open loop and closed loop systems. 4M

b) Determine the transfer function of the mechanical system shown in below Fig. 6M



3.a) Derive the transfer function of armature controlled DC servo Motor. 6M

b) Write any four rules, which are used in Block diagram reduction technique. 4M

4.a) Derive the expression for rise time and peak over shoot of second order system. 5M

b) Determine the step, ramp & parabolic error constants and their corresponding steady state errors for the following system with unity feedback. 5M



5.a) Explain the effect of adding zeroes on the performance of over shoot, rise time and bandwidth. 5M

b) What is the effect of PI Controller on response of the system?. 5M

6.a) Check the stability and comment on location of the poles of the system described by the characteristic equation . 5M

b) Describe the frequency domain specifications. 5M

7. Sketch the bode plot for the transfer function . From the bode plot,

Obtain Gain Crossover Frequency. 10M

8. Define root locus and Clearly Explain about the construction rules of root locus. 10M

9.a) Obtain the state model for the following differential equation 5M



b) Check the controllability for the above system 5M

\*\*\*THE END\*\*\*