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| **III/IV B.Tech(Regular)DEGREE EXAMINATIONS** | | | |
| **February ,2021** | **Electronics & Instrumentation Engineering** | | |
| **Fifth Semester** |  | **Control Systems** | |
| **Time: Three hours** |  | **Maximum Marks:50 Marks** | |

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| |  |  | | --- | --- | | *Answer ALL Questions from PART-A.* | (1X10 = 10 Marks) | | *Answer* ***ANY FOUR*** *questions from PART-B.* | (4X10=40 Marks) | | **Part - A** | | |
| **Answer the following questions 10 X 1=10M**   |  |  | | --- | --- | | **1.(a).** | Draw the basic elements of a closed loop control system ? | | **(b).** | Classify control systems? | | **(c).** | Define delay time (Td) ? | | **(d).** | Determine damped frequency of oscillations of a system having transfer function | | **(e).** | Name different commonly used methods to sketch frequency response of a system ? | | **(f).** | What is formula for the angle of asymptotes in a Root Locus? | | **(g).** | Draw the appropriate polar plot for a type 2 , order 4 control system? | | **(h).** | Define phase margin in Bode plot? | | **(i).** | When do you say that a system is completely Controllable? | | **(j).** | Define state space equation? |   **Part - B**   |  |  |  | | --- | --- | --- | | **2.** | Determine the overall transfer function of the system given below using Mason’s gain formula. | **10M** | | **3.** | Obtain the transfer function of the block diagram given below? | **10M** | | **4.** | Unit step response data of a second order system is given below .Obtain the corresponding frequency indicesof Resonate peak(Mr),Resonate frequency(ωr  )and Band width( ωb )for the system .   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Time in sec | 0 | 0.05 | 0.1 | 0.15 | 0.2 | 0.25 | 0.3 | 0.35 | 0.4 | 0.45 | 0.5 | | C(t) | 0 | 0.25 | 0.8 | 1.08 | 1.12 | 1.02 | 0.98 | 0.98 | 1.0 | 1.0 | 1.0 |   **P.T.O.** | **10M** | | **18EI501** | | | | **5.** | Examine the stability of the following system given by  Using Routh-Hurwitz stability criterion. | **10M** | | **6.** | Plot the Bode diagram for the following transfer function | **10M** | | **7.** | Obtain the root locus for a unity feedback system with open loop transfer function | **10M** | | **8.(a).** | Discuss the Observability of the system is given by | **5M** | | **8.(b).** | Evaluate the State Transition Matrix of a System whose state matrix is given by | **5M** | | **9.** | Determine the transfer function for the system whose state equation is | **10M** |   **download** |
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