BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

ME F343: Mechanical Vibration SECOND SEMESTER 2019-2020 Tutorial-11

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Q1. A control system having open loop transfer function, OLTF=
$$\frac{A}{(s+1)(\frac{s}{2}+1)(\frac{s}{4}+1)}$$
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- (i) For A = 15 Draw the Nyquist plot and comment on stability of the system.
- (ii) For what values of 'A' the system is stable and relatively stable. Describe with proper explanation.
- Q2. A control system having open loop transfer function, $OLTF = \frac{1}{s(s+1)(s+2)}$.
- (i) Find gain cross over frequency and phase cross over frequency.
- (ii) Find the gain margin and phase margin for the system.
- (iii) Comment on relative stability of the system with proper explanation.
- Q3. A control system having open loop transfer function, OLTF= $\frac{s+30}{(s+1)(s+2)(s+3)}$.
- (i) Draw the Nyquist plot and comment on stability of the system.
- (ii) Find the gain margin and phase margin for the system.
- (iii) Comment on relative stability of the system with proper explanation.