**MORADABAD INSTITUTE OF TECHNOLOGY, MORADABAD**

**Electrical Engineering Department**

Subject:-**Control System (REE-503)** Branch: **EE (5th G)**

**Question Bank**

**Q1.** Sketch the Polar Plot for unity feedback system,

$$G\left(s\right)=\frac{1}{s\left(s+1\right)(2s+1)}$$

**Q2.** Sketch the Polar Plot for the system, $G\left(s\right)H\left(s\right)=\frac{(1+4s)}{s^{2}\left(s+1\right)(2s+1)}$

**Q3.** Draw Nyquist plot for the system, $G\left(s\right)H\left(s\right)=\frac{60}{\left(s+1\right)\left(s+2\right)(s+5)}$

**Q4.** What do you understand by “Compensation” in control system? What are different types of compensators?

**Q5.** Draw the bode plot for the system, $G\left(s\right)=\frac{10}{s\left(1+0.4s\right)(1+0.1s)}$

Comment on its stability.

**Q6.** Check weather the given system is Observable and Controllable or not:

$$\left[\genfrac{}{}{0pt}{}{\dot{x\_{1}}}{\dot{x\_{2}}}\right]=\left[\begin{matrix}3&0\\2&4\end{matrix}\right]\left[\genfrac{}{}{0pt}{}{x\_{1}}{x\_{2}}\right]+\left[\genfrac{}{}{0pt}{}{0}{1}\right]u$$

$$y=\left[\begin{matrix}1&0\end{matrix}\right]\left[\genfrac{}{}{0pt}{}{x\_{1}}{x\_{2}}\right]$$

Q7. Draw the Nyquist plot for the unity feedback system whose open loop transfer function is

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Q8. Define: (i) State (ii) State Variables (iii) State Vector (iv) State Space (v) State Equation (vi) STM and its properties

Q9. For the given transfer function draw bode plot,

$$G\left(s\right)=\frac{s(s+0.25)}{s^{2}\left(s+1\right)(s+0.5)}$$

Determine phase margin. Gain cross over frequency,m phase crossover frequency and gain margin.

Q10. What is the effect of adding pole and zero to a system?

Q11. Write short note on:

1. Lead Compensator
2. Lag Compensator
3. Lead-Lag Compensator
4. Phase Margin & Gain Margin

Q12. Check controllability for system,



Q13. The forward path transfer function of unity feedback control system is G(s)=100/s(s+6.45)

Find Resonant Peak Mo, Resonant Frequency w0 and Bandwidth?

Q14. Establish the correlation between time response and frequency response analysis and suitably explain with diagrams.