School of Engineering
B.TECH Electrical Engineering
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

Sem IV - G2UB407T - Control Systems

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Explain how negative feedback helps in reducing the effects of disturbances in control systems. K2 (2)

2) Define the concept of block reduction in control systems. How does it simplify complex control systems? K1 (3)

3) Explain the main components of an open loop control system. K2 (4)

4) Illustrate the example of an open-loop control system in daily life. K2 (6)

5) The transfer function of a system is given as $81/(s^2 + 16s + 81)$. Find the undamped natural frequency, damping ratio, and peak time for a unit step input. K3 (6)

6) The signal flow graph for a system is given below. Find the transfer function U(s)/Y(s) for this system. K3 (9)
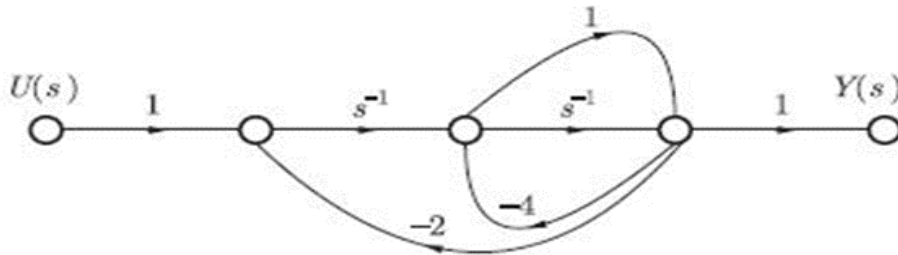
7) A system with transfer function $Y(s)/X(s)=s/s+ p$ has an output $y(t)= \cos(2t-\pi/3)$ for the input signal $x(t)=p \cos(2t-\pi/2)$. Calculate the system parameter p. K4 (8)

8) A causal system having the transfer function $H(s) = 1/(s + 2)$ is excited with $10u(t)$. Calculate the time at which the output reaches 99% of its steady state value. K4 (12)

OR

A ramp input applied to an unity feedback system results in 5% steady state error. Calculate the type number and zero frequency gain of the system. K4 (12)