

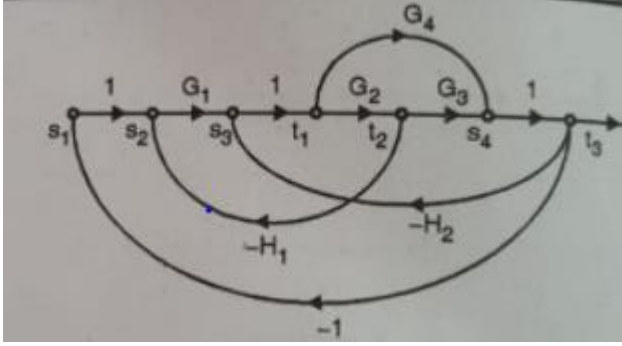
Vidyavardhini's College of Engineering & Technology, Vasai

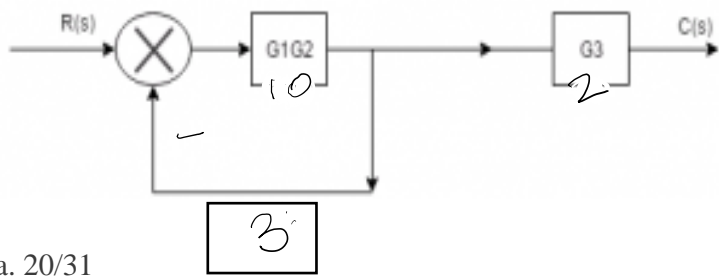
Department of Electronics & Telecommunication Engineering

Sub: Electronic Instrumentation & Control

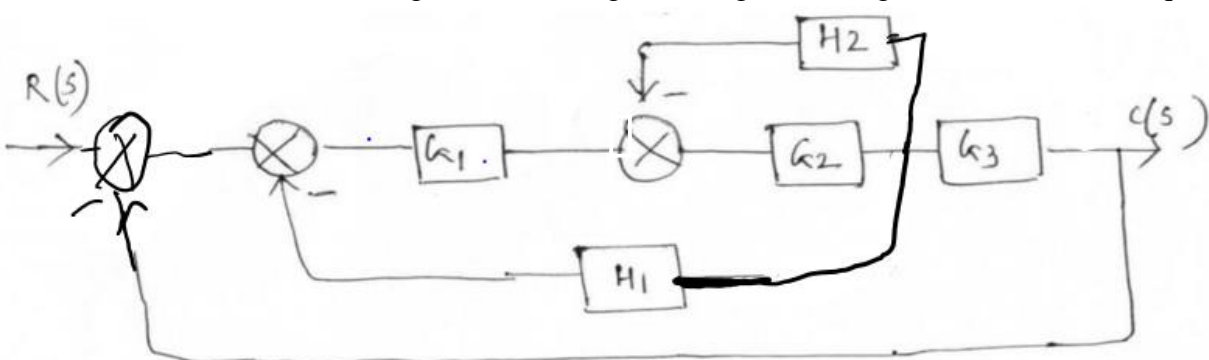
Year/Sem:- SE/III

Question No	Question	Marks
1	Choose the properties of a conductor material to be used as an element of RTD. a. the change in resistance per unit change in temperature should be as small as possible. b. the resistance of the materials should not have continuous and stable relationship with temperature. c. the change of resistance with the temperature is not be a liner function. d. resistance of metal should increase with increase in temperature.	2
2	Which one is not the pressure sensitive primary device? a. Helical b. Bellow c. Flat d. Curved	2
3	LVDT which is an instrument for the measurement of displacement, works on the principal of a. Linear inductance b. Non - linear inductance c. Mutual inductance d. Linear capacitance	2
4	Which of the following is not a characteristic of an ideal transducer? a. High dynamic range b. Low linearity c. High repeatability d. Low noise	2
5	If a transducer is resistive transducer and whose resistance varies with applied force identify the transducer a. RTD b. Thermostat c. Thermistor d. Strain gauge	2
6	Which bridge is used to measure the low Q values a. Hay's Bridge b. Schering Bridge c. Kelvin's Double Bridge d. Maxwells Bridge	2

7	<p>What is the term used to express the ability of a measuring system to maintain its standard performance?</p> <p>a. Deflection b. Stability c. Sensitivity d. Linearity</p>	2
8	<p>Change in resistance is measured using a _____</p> <p>a. Kelvin's Double bridge b. Schering's bridge c. Hay's bridge d. Maxwell's bridge</p>	2
9	<p>For the given signal flow graph how many feedback paths are there:</p>  <p>The diagram shows a signal flow graph with nodes $s_1, s_2, s_3, s_4, t_1, t_2, t_3$. Forward paths are: $s_1 \rightarrow s_2 \xrightarrow{G_1} s_3 \xrightarrow{1} t_1 \xrightarrow{G_2} t_2 \xrightarrow{G_3} s_4 \xrightarrow{1} t_3$; $s_1 \xrightarrow{1} t_1 \xrightarrow{G_2} t_2 \xrightarrow{G_3} s_4 \xrightarrow{1} t_3$; $s_1 \xrightarrow{1} t_2 \xrightarrow{G_3} s_4 \xrightarrow{1} t_3$; $s_1 \xrightarrow{1} t_3$. Feedback paths are: $t_3 \xrightarrow{-1} s_1$; $t_3 \xrightarrow{-H_1} s_2$; $t_3 \xrightarrow{-H_2} s_3$; $t_2 \xrightarrow{G_4} s_3$.</p> <p>a. 6 b. 5 c. 4 d. 3</p>	2
10	<p>For the equation, $G(s)H(s) = 7/(s(s+1)(s+2))$ how many poles lies on the LHS of s-plane</p> <p>a. Zero b. One c. Two d. Three</p>	2
11	<p>In signal flow graph, loop which do not possess any common node are said to be _____ loops.</p> <p>a. Forward gain b. Touching loops c. Non touching loops d. Feedback gain</p>	2

12	<p>For the block diagram given in the following figure, the expression of C/R is:</p>  <p>a. 20/31 b. 20/29 c. 72/31 d. 72/29</p>	2
13	<p>The overall transfer function from block diagram reduction for cascaded blocks is :</p> <p>a. Sum of individual gain b. Product of individual gain c. Difference of individual gain d. Division of individual gain</p>	2
14	<p>The characteristic equation of a system is given as $s^3+3s^2+2s+7=0$. This system is:</p> <p>a. Stable b. Marginally stable c. Unstable d. Linear</p>	2
15	<p>For a unity feedback system, the open loop transfer function is $G(s) = K(s+2)/s^3(s+5)(s+10)$. What is the type of system?</p> <p>a. One b. Two c. Three d. Four</p>	2
16	<p>For a unity feedback system, with unity feedback $G(s) = 20(s+2)/s(s+1)(s+5)$. What is the velocity error constant K_v</p> <p>a) 20 b) 18 c) 10 d) 8</p>	2
17	<p>The number of root locus segments which do not terminate on zeros are _____</p> <p>a. The number of poles b. The number of zeros c. The difference between the number of poles and the number of zeros d. The sum of the number of poles and the number of zeros</p>	2

18	The root locus of the plots of the variations of the poles of the closed loop system function with changes in a. Open loop gain b. Open loop poles c. Closed loop zeros d. None of the above	2
19	For $G(s)H(s) = \frac{100(s+3)}{(s+1)(s+5)}$ for Bode plot determine the phase angle at $\omega=1$. a. 127 b. 155 c. -127 d. -155	2
20	In a bode magnitude plot, if a system is 2nd order all-pole system, its slope will be? a. -80dB/decade b. -40 dB/decade c. 40 dB/decade d. 80 dB/decade	2

Q2	Answer any four	
A	Define sensitivity, resolution, hysteresis, calibration and linearity.	5
B	State basic requirement of transducer.	5
C	Explain working and construction of thermistor.	5
D	Find the transfer function for the given block diagram using block diagram reduction technique. 	5
E	A unity feedback system has open loop transfer function $G(s) = \frac{(1+0.2s)}{s(s+2)}$ for unit step response obtain rise time, peak overshoot, settling time, delay time	5
F	Check whether the given system is stable $S^5+2S^4+7S^3+3S^2+6S+12$	5

Q3	Solve any two	
A	How is displacement measured? State transducers used for displacement measurement.	10
B	Draw Maxwell's bridge and derive the balance equation.	10
C	Sketch the root locus of a unity feedback control $G(s) = \frac{k}{s(s+6)(s+8)}$ and determine the value of k for marginal stability.	10