

**VIT**

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Vellore – 632014, Tamil Nadu, India
SCHOOL OF ELECTRONICS ENGINEERING
FALL SEMESTER 2024-2025
CAT-1

Programme: B. Tech	Branch: ECE	Course code: BECE3021
Course Name: Control Systems		Date: 31/08/2024
Class Nbr: VL2024250102843, VL2024250102850, VL2024250102854, VL2024250102860, VL2024250102863	Max Marks: 50	Duration: 90 mins
Faculty name(s): RAJESH R, BAGUBALI A, CHITTARANJAN NAYAK, GOPINATH P, NISHA J S		

General instruction(s): 1. Answer ALL

Q. No	Question	Marks
1.	<p>a) During a medical operation, an anesthesiologist controls the depth of unconsciousness by controlling the concentration of isoflurane in a vaporized mixture with oxygen and nitrous oxide. The depth of anesthesia is measured by the patient's blood pressure. The anesthesiologist also regulates ventilation, fluid balance, and the administration of other drugs. In order to free the anesthesiologist to devote more time to the latter tasks, and in the interest of the patient's safety, we wish to automate the depth of anesthesia by automating the control of isoflurane concentration. Draw a functional block diagram of the system showing pertinent signals and subsystems.</p> <p>b) Draw the block diagram of a closed loop cloth dryer control system. Identify the controller, correction element, process element and measurement element. Also write the functions of each of the elements present in the block diagram.</p>	10
2.	<p>For the mechanical rotational system shown in Fig. 1, a) Obtain the Transfer function $\frac{\theta_2(s)}{T(s)}$ b) Draw Torque-Voltage and Torque-Current analogous circuits.</p>	10

Fig. 1



3. Find the transfer function $V_o(s)/V_i(s)$ for the electrical network shown in Fig. 2.

10

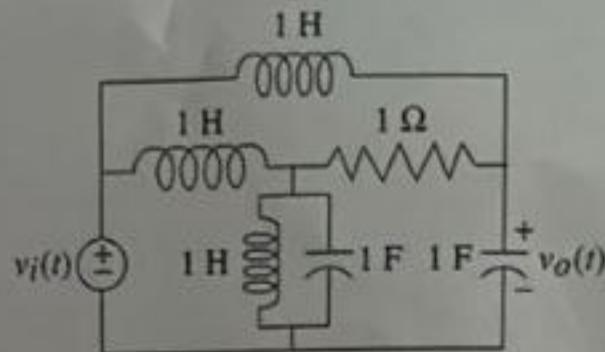


Fig. 2

4. For the system represented by the block diagram shown in Fig. 3, find the transfer function $\frac{V_o(s)}{V_i(s)}$ using the block diagram reduction technique.

10

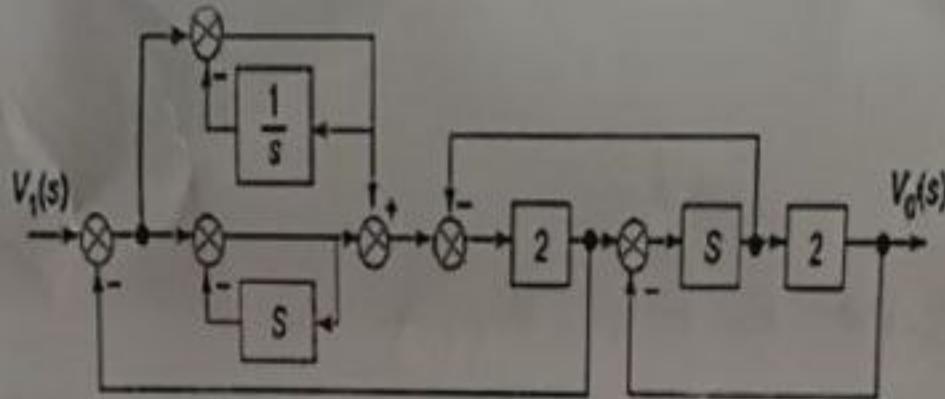


Fig. 3

5. Determine the transfer function $C(S)/R(S)$ for the signal flow graph given in Fig. 4 using Mason's gain formula.

10

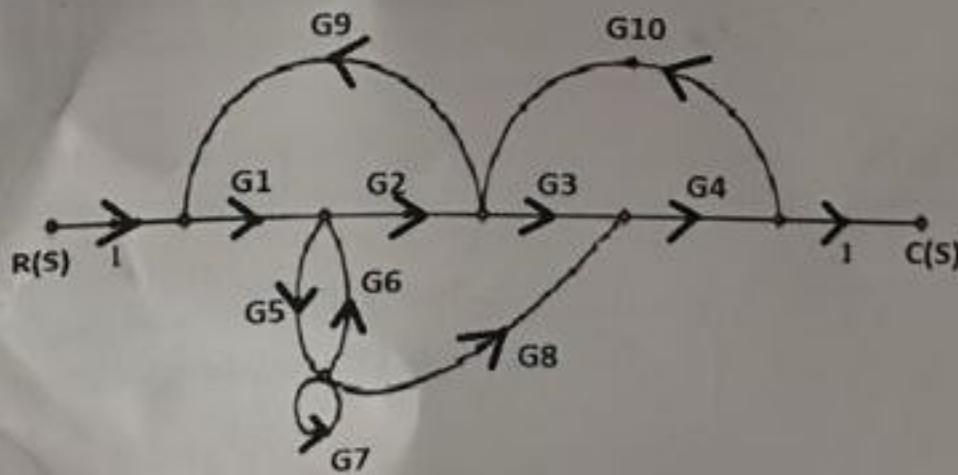


Fig. 4

Faculty sign:

Moderator Name:

Moderator Sign:

