



P.E.S. College of Engineering, Mandya - 571 401
 (An Autonomous Institution affiliated to VTU, Belagavi)
Fifth Semester, B.E. - Industrial and Production Engineering
Semester End Examination; Feb. - 2021
Control Engineering and Machine Tool Technology

Time: 3 hrs

Max. Marks: 100

Note: I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks
I : PART - A		10
I a.	Define control system.	2
b.	Explain associative law in block diagram.	2
c.	Define Machine Tool.	2
d.	List general requirement of Machine Tool.	2
e.	Write the equation for geometric progression.	2
II : PART - B		90
UNIT - I		18
1 a.	Explain the basic requirement of an ideal control system.	9
b.	With a neat sketch, explain one real time example of open loop and closed loop system.	9
c.	With a neat sketch, explain feedback and feed forward system.	9
UNIT - II		18
2 a.	Explain the input selected as Step of magnitude "A" assume the system is of type zero and one and also determine the steady state error.	9
b.	Derive the Steady state error e_{ss} , Steady State response and Transient response.	9
c.	With a sketch, explain the following standard inputs:	9
	i) Step input ii) Ramp input iii) Parabolic input	9
UNIT - III		18
3 a.	With a neat sketch, explain the following:	9
	i) Shifting the summing point behind the block	9
	ii) Shifting the summing point front of the block	9
b.	Draw the corresponding signal flow graph and hence determine the overall transfer function of the block diagram shown in Fig. 3(b) using Mason's gain formula.	9

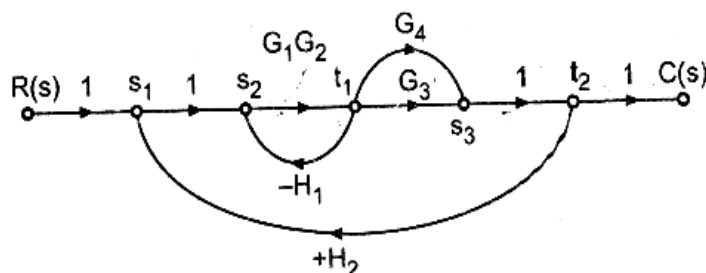


Fig. 3(b)

- c. Determine the overall transfer function for the signal flow graph shown in Fig.3(c) using Mason's gain formula.

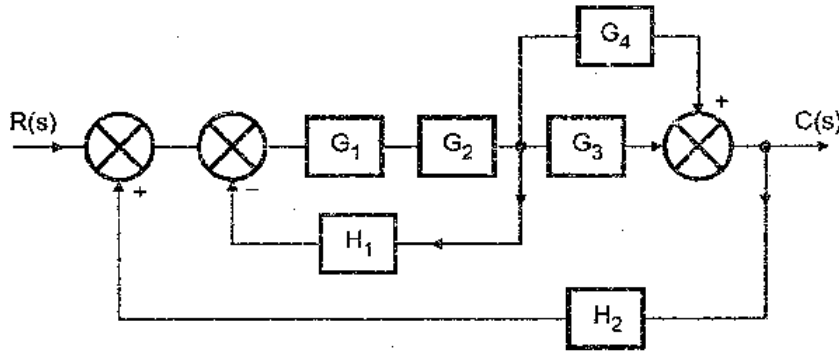


Fig. 3(c)

UNIT - IV

9

18

- 4 a. With a neat sketch, explain the method of production of surfaces. 9
- b. With a neat sketch, explain the control system of machine tools. 9
- c. With a neat sketch, explain the cutting motion in machine tools. 9

UNIT - V

18

- 5 a. Calculate the spindle speeds and draw the speed distribution for Gear box of minimum speed 800 rpm and maximum speed 2000 rpm with 8 speed using geometric progression, also determine; 9
 - i) Number of teeth on each gear
 - ii) Torque transmitted on each shaft
 - iii) Draw the gear layout
- b. Draw the speed distribution for 12 speeds and calculate the spindle speed minimum speed 200 rpm and maximum speed 1800 rpm. 9
- c. With a neat sketch, explain the construction and working of Ruppert drive. 9

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