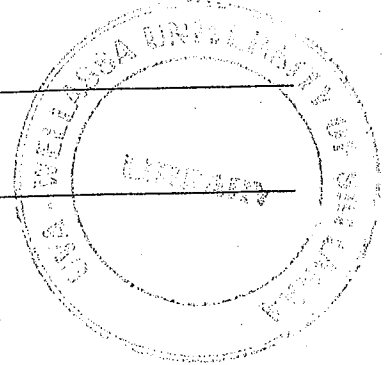




Time: One (01) hour

Total 03 Questions
 Answer two(02) questions only



1. Fig Q1 shows a Liquid level system. In this system, two tanks interact.

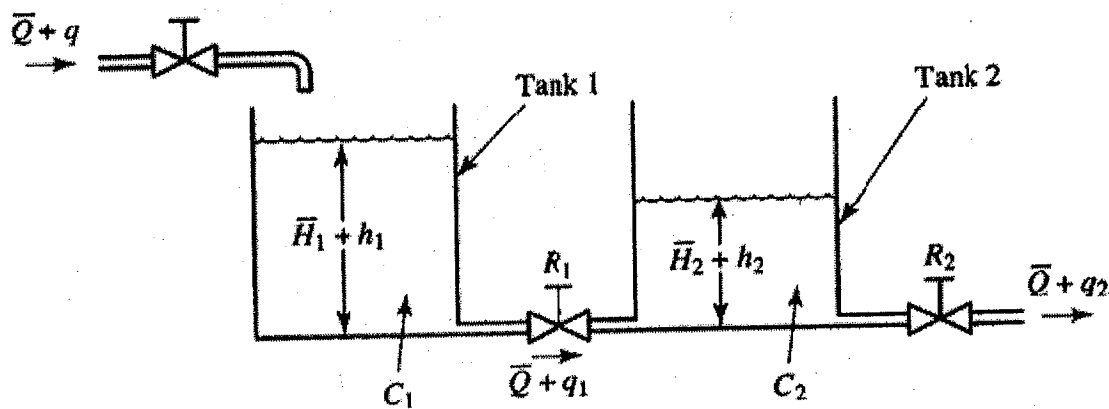


Fig Q1

\bar{Q} = Steady State Flow Rate

\bar{H}_1 = Steady State Liquid Level of Tank 1

\bar{H}_2 = Steady State Liquid Level of Tank 2

Assume only small variations from steady state value. Using the symbols as defined in the Fig Q1, obtain equations for this system. Use these equations to determine the transfer function for the system.

(50 marks)

2. Combination of the generator and motor shown in Fig Q2 is widely used in the industry. It is called the *Ward Leonard* system. Develop a block diagram for the system. Find the transfer functions from u to v_g and from v_g to θ .

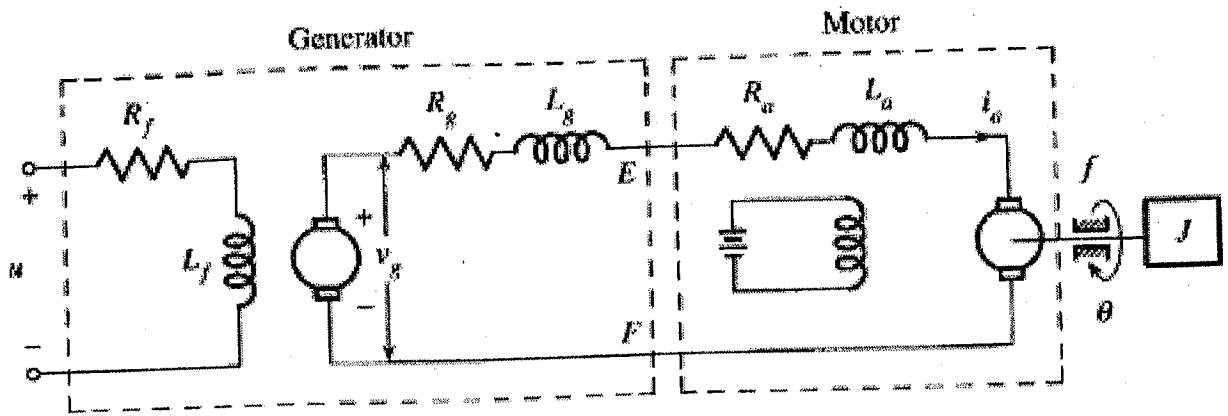


Fig Q2

(50 marks)

3. A voltage control system is given in Fig Q3. This system is designed so that the load voltage v_L remains constant despite any changes in the load R_L .
- I. Write differential equations that describe the voltage control system.
 - II. Obtain transfer functions for local modules.
 - III. Draw the block diagram for the system.
 - IV. Derive the system transfer function.

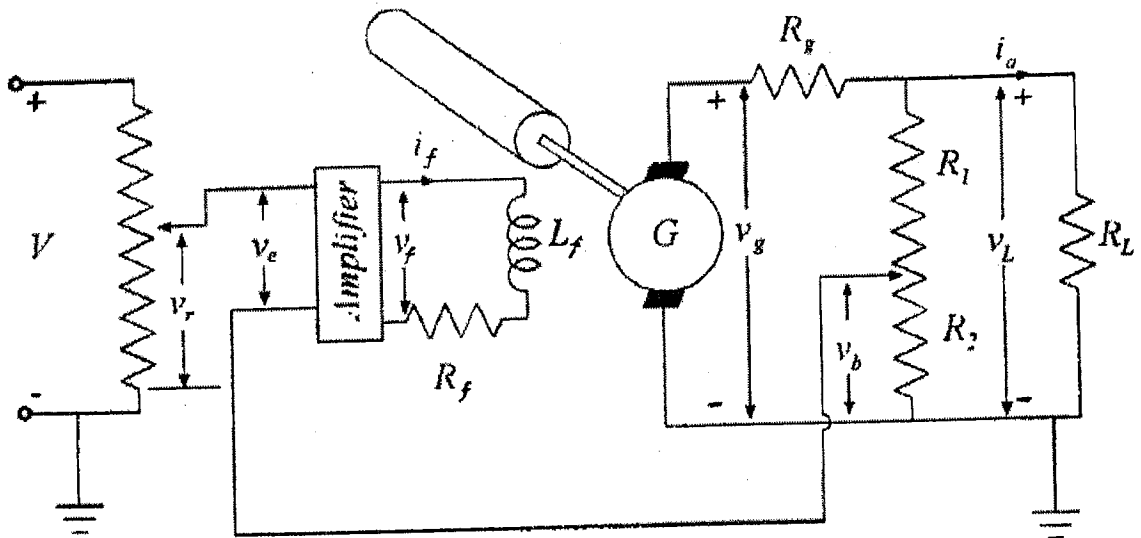


Fig Q3

(50 marks)