B.Tech. Degree VIII Semester Regular/Supplementary Examination in Marine Engineering June 2023

MRE 1806 (C) FLUID CIRCUITS AND CONTROL (ELECTIVE)
#### (2013 *Scheme*)

Time: 3 Hours

Maximum Marks: 100

(Answer *ALL* questions) $(5 \times 20 = 100)$

I.   Describe the working of Pressure Control valves with neat diagram, symbol, and applications for each.   (20)

OR

II. Explain the following: (20)
  (i)   Needle valve
  (ii)   Flexible hose
  (iii) Relay.

III. (a) Explain the working of typical pump set with diagram.   (7)
  (b) List the advantages and disadvantage of fluid power.   (8)
  (c) Give the properties of air used in pneumatic control system.   (5)

OR

IV. (a) Derive the transfer function of hydraulic system.   (12)
  (b) With a neat sketch explain hydraulic reservoir.   (8)

V. (a) Explain the working of Reciprocating pumps and Centrifugal pumps with neat diagrams and symbol.   (12)
  (b) What are pressure intensifiers? Explain with diagram.   (8)

OR

VI. Explain positive displacement pumps with neat diagrams.   (20)

VII. (a) Explain open loop and Closed loop control system with an example. Explain its advantages and disadvantages.   (10)
  (b) Reduce the block diagram and find the transfer function of the following system.   (10)
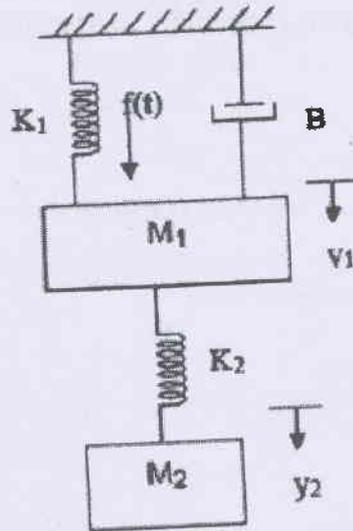

OR
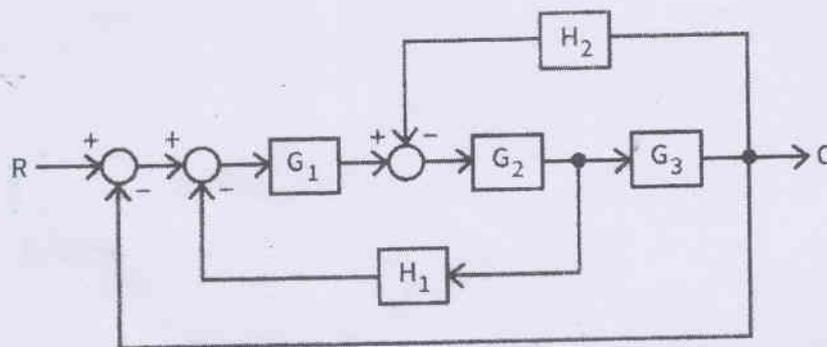
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VIII. Draw the Force Voltage and Force Current analogous circuits for the given Mechanical translational system. Also write the differential equations governing the system. (20)

IX. Explain with neat sketches: (20)
  (i) Hydraulic press
  (ii) Hydraulic lift.

OR

X. Explain Routh Hurwitz stability criterion. Use it to determine the range of K that stabilises the closed loop control system shown below (20)

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