B

B.Tech. Degree VIII Semester Examination in Marine Engineering May 2019

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

Time: 3 Hours   Maximum Marks: 100

$(5 \times 20 = 100)$

I.   (a) Explain hydraulic conductors with neat diagram.   (15)

    (b) With neat diagram explain solenoid actuated valves?   (5)

<div align="center">OR</div>

II. (a) Explain the following: (5)
        (i) Pressure switch
        (ii) Disconnect coupling

    (b) Explain the different types of flow control valves.   (15)

III. (a) Explain hydraulic system with examples. Derive the transfer function for the hydraulic   (20)
      system. State the advantages and disadvantages of hydraulic system.

<div align="center">OR</div>

IV. (a) List the basic components of pneumatic and hydraulic system.   (5)

    (b) Explain hydraulic reservoirs.   (10)

    (c) List the primary functions and properties of hydraulic fluid.   (5)

V.   Explain different type of accumulators.   (20)

<div align="center">OR</div>

VI. (a) What is pressure intensifier? Explain with neat diagram and symbols.   (10)

    (b) Explain vane pump and screw pump.   (10)

VII. (a) Derive the transfer function for armature controlled DC motor.   (8)

    (b) Obtain the transfer function of the system shown in figure.   (12)
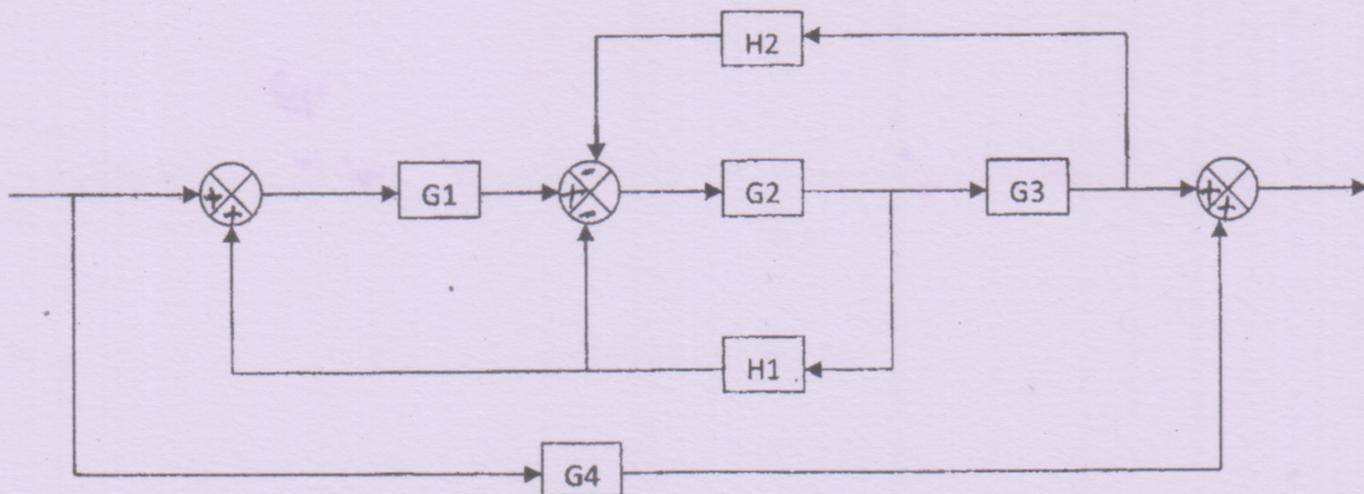
<div align="center">OR</div>

<div align="right">(P.T.O.)</div>

VIII. Write the differential equation governing the mechanical system. Also draw the (20) force voltage and force current circuits and verify it.
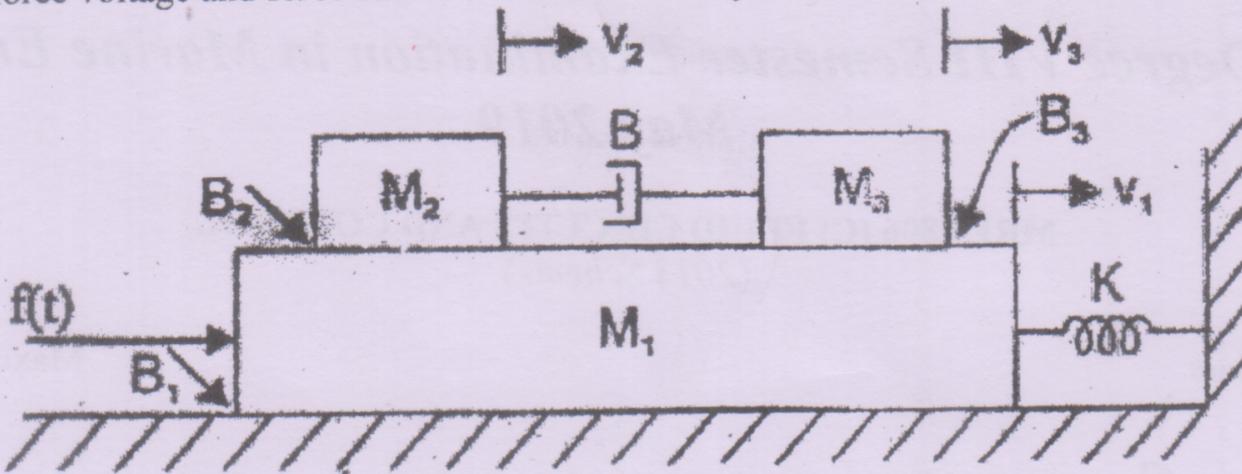
IX. Sketch the root locus for the unity feedback system for the open loop transfer (20) function $\dfrac{K}{S(S^2+6S+10)}$.

OR

X. (a) The open loop transfer function of unity feedback control system is given by (12) $G(S) = \dfrac{K}{(S+2)(S+4)(S^2+6S+25)}$. Determine the value of K which will cause sustained oscillations in the closed loop system. What are the corresponding oscillating frequencies?

(b) Explain hydraulic press. (8)

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