

***B.Tech. Degree VIII Semester Supplementary Examination in
Marine Engineering July 2017***

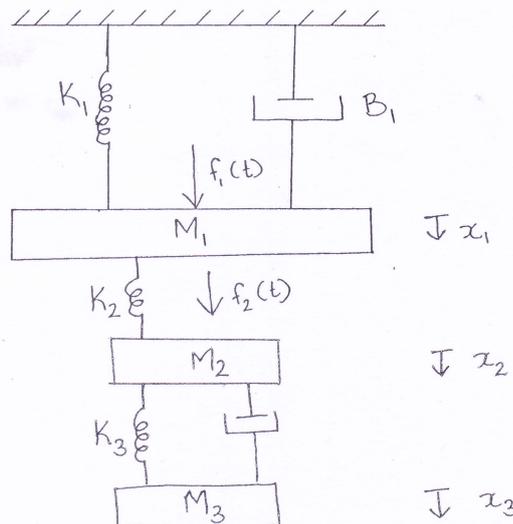
MRE 805 (C) FLUID CIRCUITS AND CONTROL
(Prior to 2013 scheme)

Time: 3 Hours

Maximum Marks: 100

(4 × 25 = 100)

- I. (a) Explain different types of direction control valves with diagram, symbol and working for each. (20)
(b) Explain sealing and packing. (5)
- OR**
- II. (a) Explain how a pressure relief valve works with neat diagram. (8)
(b) Explain the working of needle valve with diagram, symbol and its application. (7)
(c) Explain the following: (5 + 5 = 10)
(i) Relay.
(ii) Flexible hoses.
- III. (a) Compare hydraulic and pneumatic system. (6)
(b) Derive the transfer function for hydraulic and pneumatic system. (15)
(c) What are the applications of fluid power? (4)
- OR**
- IV. (a) Explain the properties of fluid for hydraulic control. (10)
(b) Explain the working of a typical pump set with diagram. (7)
(c) List the advantages and disadvantages of fluid power. (8)
- V. (a) What is a compressor? Explain different types of compressors and its working with diagrams. (15)
(b) Find the electrical analogous circuit for the mechanical system and find the transfer function. Draw the circuit using voltage source and show the F-V relations. (10)

**OR****(P.T.O.)**

- VI. (a) Explain different types of accumulators with diagrams. (12)
 (b) Draw and explain one application of accumulator with neat circuit. (8)
 (c) Compare positive and non positive displacement pumps. (5)

- VII. (a) Find the unit step response of a system whose transfer function is given by (10)

$$\frac{5}{s^2 + 5s + 6}$$

- (b) The open loop transfer function of a unity feedback control system is given (15)

$$\text{by } \frac{k}{(s+2)(s+4)(s^2+6s+25)}$$

Using Routh Hurwitz criteria, discuss the stability of the closed loop system as a function of K . Find the value of K for sustained oscillations and the corresponding oscillating frequencies.

OR

- VIII. (a) Explain the working of hydraulic lift with diagrams. (7)
 (b) Sketch the root locus for the system with open loop transfer function (18)

$$\frac{K}{S(s+4)(s^2+4s+20)}$$
