BT-MRE-VIII-07-14-0575 Reg.No. | | | | | | | | |

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B.Tech. Degree VIII Semester Examination in Marine Engineering July 2014

MRE 805 FLUID CIRCUITS AND CONTROL

(2006 Scheme)

Time : 3 Hours Maximum Marks : 100

(4 x 25 = 100)

I. (a) Explain the different types of valves used for the pressure control. (11)

(b) Write a note on piping and fitting in mechanical systems. (6)

(c) Draw the symbols of different types of pumps and explain their functions. (8)

OR

II. (a) Explain the different types of valves used for the velocity control and also draw the symbols of the valves. (18)

(b) Distinguish between vertical and horizontal stacking. (7)

III. Distinguish between hydraulic and pneumatic systems with example, transfer functions, advantage, disadvantage and functions etc. (25)

OR

IV. (a) Explain the properties of liquids for hydraulic control. (9)

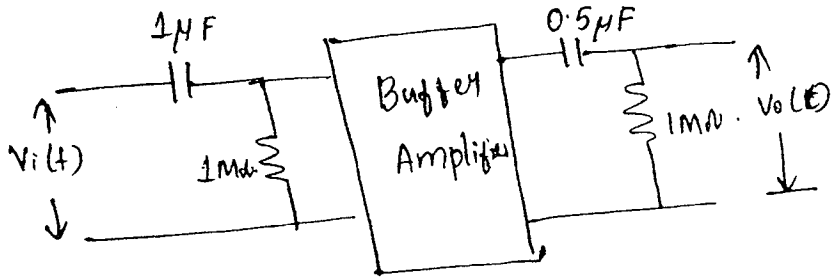
(b) Explain the properties of air for pneumatic control. (9)

(c) Explain the advantages of fluid circuit. (7)

V. (a) Draw a centrifugal pump and explain its properties? (7)

(b) Distinguish between open loop and closed loop system. (6)

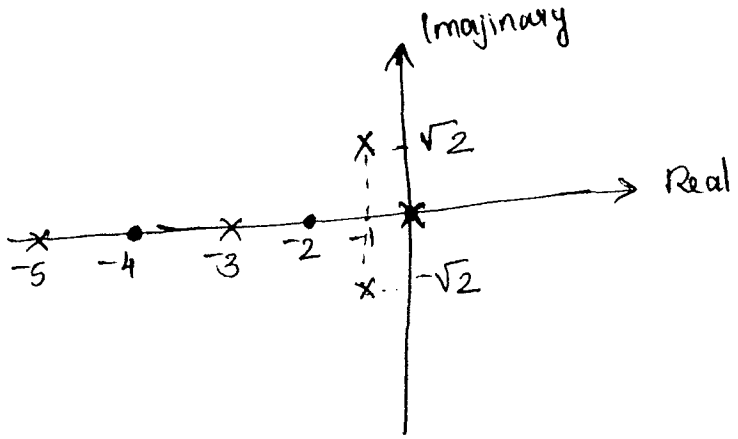
(c) Find the transfer function of the given system. (12)



OR

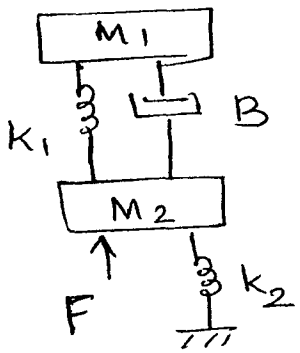
(P.T.O.)

VI. (a) Determine the transfer function if the d.c. gain (k value) is 10 for the system whose pole-zero plot is shown below: (6)



(b) What is transfer function? How do the poles and zeros play a higher role in the stability of the system? Prove it with the help of some examples. (8)

(c) Draw electrical-analogous circuit of the given mechanical system. (11)



VII. (a) Explain the working of hydraulic press and hydraulic lift with the help of necessary diagrams. (10)

(b) What is root locus? How does it play an important role for finding the stability of the system? Sketch the root Locus for the given open loop transfer function is (15)

$$G(S) = \frac{k}{S(S^2 + 4S + 13)}$$

OR

VIII. (a) Explain the working of a fluid torque converter. (6)

(b) Compare between the terms 'angle of arrival' and 'angle of departure', which is used in the root locus. (7)

(c) Find the stability of the given systems and give comment about the stability and locate the positions of poles. (2 x 6 = 12)

(i) $S^5 + 2S^4 + 3S^3 + 6S^2 + 2S + 1$

(ii) $S^8 + 5S^6 + 2S^4 + 3S^2 + 1$

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