BT-MRE-VIII(R/S)-07.22-0069 Reg. No. | | | | | | | | |

B

B.Tech. Degree VIII Semester Regular/Supplementary Examination in Marine Engineering July 2022

MRE 1806(C) FLUID CIRCUITS AND CONTROL

(*2013 Scheme*)

Time: 3 Hours Maximum Marks: 100

(5 × 20 = 100)

I. Explain the working of Check valve and Shuttle valve with diagram, symbol and applications for each. (20)

OR

II. Explain the working of Pressure Relief valve and Needle valve with diagram, symbol and applications. (20)

III. Derive the transfer function of a Pneumatic system and a Hydraulic system with diagrams and compare them using tabular column. (20)

OR

IV. (a) List the properties of air for pneumatic control. (10)

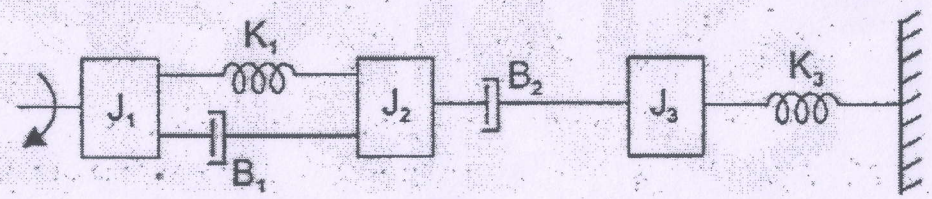
(b) Explain the working of a Hydraulic reservoir with a neat sketch. (10)

V. What is a compressor? Explain Vane compressors and Screw compressors and its working with diagrams and applications. (20)

OR

VI. Explain any three types of positive displacement pumps with its working and diagrams. (20)

VII. Find the Torque Voltage and Torque Current electrical analogous circuit for the mechanical rotational system given below with all the steps for the same. (20)



OR

VIII. (a) Define Transfer function and Explain the properties of Transfer function. (10)

(b) Explain Open loop system and Closed loop system with one example. (10)

IX. (a) The open loop transfer function of a unity feedback control system is given by $\frac{K(s+1)}{s^3 + as^2 + 2s + 1}$ Using Routh Hurwitz criteria,Find the value of **K** and **a** for system to oscillate with oscillating frequency of 2 rad/sec. (10)

(b) What is Impulse response? Explain the impulse response and stability for all possible location of roots of Characteristic equation with rough graphs. (10)

OR

X. Sketch the Root locus for the unity feedback system with open loop transfer function given by, $G(s) = \frac{K(s+1.5)}{s(s+1)(s+5)}$. (20)

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