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3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE : **10**

(a) Define 'lubricity' and 'naturalization number' for the given hydraulic oil.

(b) State the value of Reynold's number for Laminar and Turbulent fluid flow through pipe.

(c) Draw the symbol of (i) Dead weight accumulator (ii) Oil tank.

(d) Draw neat labelled sketch of vane pump.

(e) Draw the symbol of 3/2 direction control valve.

(f) State the difference between steady and unsteady fluid flow.

(g) Enlist any two examples of ISO grades of oil with their applications.

2. Attempt any THREE : **12**

(a) With the help of neat labelled sketch, explain the working of Bourden tube pressure gauge.

(b) Write the assumptions used in deriving Bernoulli's equation. Also write the meaning of the terms used in Bernoulli's equation.

(c) Explain the construction and working of spring loaded accumulator used in hydraulic system.

(d) Explain working of pressure compensated flow control valve with neat labelled diagram.

3. Attempt any THREE : **12**

(a) A rectangular plate of length 2 m and depth 0.5 m is placed vertically in an oil of specific gravity 0.8 so that the top of the plate touches the free surface of the oil. Determine the value of total pressure and the depth of centre of pressure.

(b) Explain the working of reciprocating compressor with the help of neat labelled sketch.

(c) Explain working of sequence valve with neat labelled diagram.

(d) Explain any four minor losses in a fluid flow through fittings and valves.

4. Attempt any THREE : **12**

(a) The reservoir built 10 km away from city has to supply water at the rate of 5 m^3/s. The head loss due to friction and others in pipe is 15 m. Calculate the size of supply pipe using Darcy – Weisbach equation. Take coefficient of friction (f) as 0.008.

(b) State two applications of each of the following accessories of hydraulic and pneumatic system : (i) pipes and hoses (ii) oil filters (iii) seals and gaskets (iv) muffler

(c) Explain the working of 2/2 direction control valve.

(d) Enlist common faults (any 4) obstructing the working of the oil hydraulic systems and their remedies.

(e) Draw pneumatic circuit to control the speed of Bi-directional air motor.

5. Attempt any TWO : **12**

(a) Differentiate between hydraulic system and pneumatic system.

(b) Explain the working of Pilot Operated – Pressure Relief Valve.

(c) Explain pilot control double acting cylinder (impulse circuit) with the help of circuit diagram.

6. Attempt any TWO : **12**

(a) Draw neat labelled sketch of (i) Shuttle valve (ii) Quick exhaust valve (iii) Time delay valve

(b) Differentiate between meter-in circuit and meter-out circuit with the help of circuit diagram.

(c) Explain sequencing circuit for operating two single acting cylinders in sequence.
