22655

24225

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

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

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

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

Marks

1. Attempt any FIVE of the following: **10**

a) List any four desirable properties of hydraulic oil used in hydraulic system.

b) Sketch and label actual construction of double acting cylinder.

c) Draw ISO symbol of –

i) Three way to position normally closed poppet type direction control valve.

ii) Pressure relief valve.

d) What is oil filter? List the type of filters.

e) Give the classification of pumps.

f) Draw neat sketch of non-compensated flow control valve.

g) What is an F-R-L unit and give the graphic symbol of it?

P.T.O.

Marks

2. Attempt any THREE of the following: **12**

a) What are the selection criteria for hydraulic pumps?

b) Explain with neat sketch working of piston type gas charged accumulator.

c) State which of the following circuit is more effective for clamping of component during drilling operation –

i) Meter in

ii) Meter out.

Justify your selection.

d) Define electro-pneumatic system and list its elements.

3. Attempt any THREE of the following: **12**

a) Differentiate between gear pump and piston pump on the basis of function construction, pressure range and delivery of oil.

b) What is flow control valve. Explain pressure compensated flow control valve.

c) A machine hold the steel sheet and then punches a hole. The sheet is released when the punch goes back. Suggest and draw the suitable circuit for this situation.

d) Sketch and explain speed control of Bi-directional air motor in pneumatic system.

4. Attempt any THREE of the following: **12**

a) Draw actual hydraulic system and explain its working.

b) Explain with neat sketch pressure reducing valve.

c) Classify seals. Explain any one with neat sketch.

d) What is mean by synchronisation of cylinder motion? Name the various method to achieve it.

e) Explain with neat sketch working of impulse operation pneumatic circuit.

Marks

5. Attempt any TWO of the following: **12**

a) Below some problems were mentioned. Write probable causes and Remedy of it –

i) Excessive noise in hydraulic pump.

ii) Excessive heat in oil.

iii) Pressure control valve not functioning correctly.

b) Explain 4way - 3position direction control valve used in hydraulic system with sketch.

c) The piston and DA cylinder is having following dimensions –

i) OD of piston = 70 mm

ii) Stroke length = 80 mm

iii) Diameter of piston rod = 15 mm

iv) Time require to complete the stroke is 4 seconds. Then find out:

1) Force area of piston

2) Force area of piston on piston rod side

3) Linear velocity of piston.

6. Attempt any TWO of the following: **12**

a) What are the factor to be consider for selection of –

i) Direction control valve

ii) Flow control valve

iii) Pressure control valve.

b) How pipes are specified. What is Hose? Explain the factor affecting selection of pipe in hydraulic system.

c) Sequencing operation of two double acting pneumatic cylinders are required as follows –

i) Cylinder A extends

ii) Cylinder B extends

iii) Cylinder A retracts

iv) Cylinder B retracts

Develop a pneumatic circuit using pilot operated 4/2 DCV and roller operated valves. (Do not use sequence valves)