

Total No. of Questions : 12]

SEAT No. :

P3313

[Total No. of Pages : 4

[4959]-34

B.E. (Mechanical) (Semester - I)

INDUSTRIAL FLUID POWER

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) Answer any three questions from Section-I and three questions from Section-II.*
- 2) Figures to the right indicate full marks.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Answers to the two sections should be written in separate answer books.*
- 5) Use of electronic pocket calculator is allowed.*
- 6) Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Write a short note on classification of “Hydraulic Fluids”. [8]
b) Write a short note on “Types of Seals”. [8]

OR

- Q2)** a) Write a short note on “Types of Filters used in Hydraulic Systems”. [8]
b) What are the “sources of contamination”? Explain in detail. [8]

- Q3)** a) Explain with neat sketch working of “External Gear Pump”. [8]
b) Explain with neat sketch working of “Bent Axis Pump”. [8]

OR

- Q4)** a) Write a short note on “Pressure and Temperature Switches”. [8]
b) Explain with neat sketch working of “Bladder Type Accumulator”. [8]

P.T.O.

- Q5)** a) Explain with neat sketch construction and working of “Pressure Relief Valve”. [9]
 b) Explain with sketch construction and working of “Counter Balance Valve”. [9]

OR

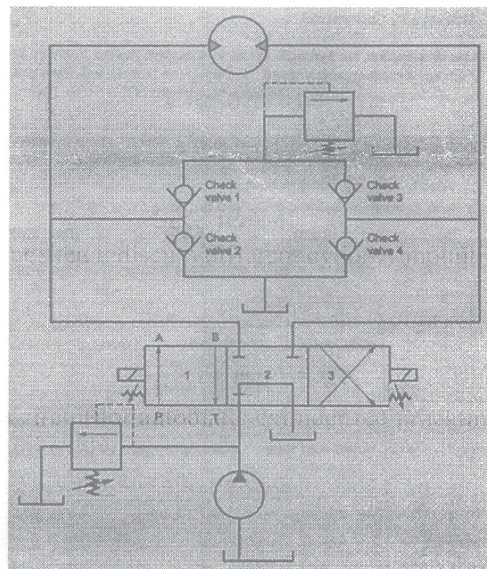
- Q6)** a) Explain with sketches :
 i) Meter in circuit
 ii) Meter out circuit [10]
 b) Draw symbols :
 i) 4/2 way lever operated D.C.V.
 ii) 4/3 way push button operated DCV
 iii) 3/2 way Roller operated valve
 iv) 5/3 way solenoid operated valve [8]

SECTION - II

- Q7)** a) With the help of neat sketch discuss different cylinder mounting methods in fluid power system. [8]
 b) Draw and explain actuator locking circuit using pilot check valves used in hydraulic system. [8]

OR

- Q8)** a) Draw and explain a circuit for automatic cylinder reciprocating of a double acting cylinder using solenoid valve. [8]
 b) Analyze the given hydraulic circuit. [8]



- Q9)** a) Discuss the factors for selection of compressors in pneumatic systems.[8]
b) Draw and explain two handed safety circuit used in pneumatics. [8]

OR

- Q10)** a) Explain with a neat sketch the working of time delay valve. [8]
b) Explain with a neat sketch working of shuttle valve with a typical application. [8]

- Q11)** a) Which are the different actuators used in pneumatics? Draw symbols of them. [6]
b) A pneumatic cylinder is needed to press fit a pin to a hole. Design a circuit diagram with a precondition that while actuating, both the hands of the operator should be engaged. [12]

OR

- Q12)** Two identical cylinders A and B are to be operated simultaneously. The cylinder a moves against a load of 25 KN while the cylinder B has a load of 20 KN. Both the cylinders have a stroke of 1 m. The return stroke of the cylinder B is to start only after the cylinder A is completely retracted. The return speeds are to be as fast as possible. Draw the circuit which will fulfill these requirements. Select different components from the data given. In case the component is not available in the data given, mention its range.[18]



DATA SHEET

DATA

(a) Suction strainer:

Model	Flow Capacity (lpm)
S ₁	38
S ₂	76
S ₃	152

(b) Pressure gauge:

Model	Range (bar)
PG ₁	0 - 25
PG ₂	0 - 40
PG ₃	0 - 100
PG ₄	0 - 160

(c) Vane pump:

Model	Delivery in lpm		
	At 0 bar	At 35 bar	At 70 bar
P ₁	8.5	7.1	5.3
P ₂	12.9	11.4	9.5
P ₃	17.6	16.1	14.3
P ₄	25.1	23.8	22.4
P ₅	39.0	37.5	35.6

(d) Relief valve:

Model	Flow capacity (lpm)	Max. working pressure & bar
R ₁	11.4	70
R ₂	19.0	210
R ₃	30.4	70
R ₄	57.0	105

(e) Flow control valve:

Model	Working pressure (bar)	Flow range (lpm)
F ₁	70	0 - 4.1
F ₂	105	0 - 4.9
F ₃	105	0 - 16.3
F ₄	70	0 - 24.6

(f) Directional control valve:

Model	Max. working pressure & bar	Flow capacity (lpm)
D ₁	350	19
D ₂	210	38
D ₃	210	76

(g) Check valve:

Model	Max. working Pressure & bar	Flow capacity (lpm)
C ₁	210	15.2
C ₂	210	30.4
C ₃	210	76

(h) Pilot operated check valve:

Model	Max. working Pressure (bar)	Flow capacity (lpm)
PO ₁	210	19
PO ₂	210	38
PO ₃	210	76

(i) Cylinder (Max. working pressure 210 bar)

Model	Bore diameter (mm)	Rod diameter (mm)
A ₁	25	12.5
A ₂	40	16
A ₃	50	35
A ₄	75	45
A ₅	100	50

(j) Oil reservoirs:

Model	Capacity (litres)
T ₁	40
T ₂	100
T ₃	250
T ₄	400
T ₅	600