Total No. of Questions : 6]

SEAT No. :

P5786

[Total No. of Pages : 2

BE/Insem./Oct.-514
B.E. (Mechanical)
HYDRAULICS AND PNEUMATICS
(2015 Pattern) (Semester - I)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4 Q.5 or Q.6.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figure to the right indicate full marks.***
4) ***Use of electronic pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) A gear pump has an outside diameter of 80mm, inside diameter of 55mm and a width of 25mm. If the actual pump flow is 1600 rpm and the actual flow rate is 95 Lpm what is the volumetric displacement and theoretical discharge. **[6]**

b) Draw the Following ISO Symbols **[4]**

i) Counterbalance Valve

ii) Limited rotation motor

iii) Cylinder with fixed cushion on both side

iv) 4/3 float center solenoid operated DCV.

OR

Q2) a) A pump has displacement volume of 98.4cm^3. It delivers of 0.0125m^3/sec of oil at 1000 rpm and 70 bar. If the prime mover input torque is 124.3N-m. What is the overall efficiency of the pump and what is the theoretical torque required to operate the pump. **[6]**

b) Draw the Following ISO Symbol **[4]**

i) 4/3 pneumatically double pilot operated DCV

ii) Pressure compensated flow control valve

iii) Shuttle valve

iv) Pump unloading valve.

P.T.O.

Q3) a) A pump supplies oil at 0.006 m^3/sec to a 40mm diameter double acting hydraulic cylinder if the load is 5000N (Extending and retracting) and the rod diameter is 20mm, find the **[6]**

i) Hydraulic pressure during extending stroke.

ii) Piston velocity during extending stroke.

iii) Cylinder kW power during extending stroke.

iv) Hydraulic pressure during retracting stroke.

v) Piston velocity during the retracting stroke.

vi) Cylinder kW power during retracting stroke.

b) What are the different cylinder mountings used in hydraulic cylinders. **[4]**

OR

Q4) a) A hydraulic motor receives a flow rate of 72LPM at a pressure of 12000kPa. If the motor speed is 800RPM, determine the actual torque delivered by the motor assuming the efficiency 100%? **[6]**

b) What do you understand from power units and state the types of accessories used in the fluid power system. **[4]**

Q5) a) Explain with neat sketch the working of a pressure compensated flow control valve. **[4]**

b) Explain the importance of various center position of a direction control valve and enlist advantages and disadvantages of each center position. **[6]**

OR

Q6) a) Explain with neat sketch the working of pilot operated pressure reducing valve. **[6]**

b) Explain in details the different methods to actuate direction control valves. **[4]**