Total No. of Questions : 8]

SEAT No. :

P3668

[Total No. of Pages : 2

[5461]-521
B.E. (Mechanical)
HYDRAULICS AND PNEUMATICS
(2015 Pattern) (Semester - I)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Figures to the right side indicate full marks.***

Q1) a) Compare the characteristics and application of hydraulic and Pneumatic drive. **[6]**

b) With a neat sketch explain the working of pressure intensifier and list application. **[6]**

c) A Pump having a displacement volume of 14 cm^3/vev. runs at 2000 r.p.m. It operates against a maximum system pressure of 150 bar. The volumetric & over all efficiency of the pump are 0.90 and 0.80 respectively. Determine. **[8]**

i) Actual power required to drive the pump.

ii) Input power required to drive the pump.

iii) The drive torque at the pump shaft.

OR

Q2) a) State & explain governing laws used in fluid power system in details. **[6]**

b) Explain with a neat sketch the construction and working of a typical hydraulic cylinder. **[6]**

c) Explain in brief any two different sources of contamination in a hydraulic system? State any two remedial measures. **[8]**

Q3) a) With neat sketches explain the advantages of tandem centre over a closed center design in a DCV. **[6]**

b) Explain with neat sketch working of pressure reducing valve draw an ISO symbol of it. **[6]**

c) Draw a pressure compensated flow control valve and explain it's working. **[6]**

OR

P.T.O.

Q4) a) Draw a hydraulic circuit for cylinder synchronization with two cylinders connected in parallel. State if it will give perfect synchronization. **[6]**

b) Draw a neat sketch of pump unloading circuit. State function of unloading valve. **[6]**

c) What is the function of pilot operated check valve. Draw the circuit involving pilot operated check valve. **[6]**

Q5) a) Draw and explain throttle-out circuit used in pneumatics. **[6]**

b) Draw and explain position dependent sequencing circuit for two cylinders in pneumatics. **[6]**

c) Explain the need of using FRL unit in pneumatic system. Also draw it's detail symbol. **[4]**

OR

Q6) a) Draw and explain the hydraulic motor breaking circuit. **[6]**

b) Draw and explain the time delay circuit used in pneumatic system. **[6]**

c) What is the purpose of providing 'pressure regulator' in pneumatic circuits? **[4]**

Q7) a) Design the hydraulic circuit for the following operations :

The circuit is required for press operation. An accumulator will supply the necessary flow once the power is shut off by the pressure switch at the end of advance stroke. Locate the pressure relief valve, check valve & other essential components of the circuit. Describe the operation of the circuit. Indicate the function of the accumulator during the operation. **[12]**

b) List four important considerations to be taken into account while designing a hydraulic circuit. **[4]**

OR

Q8) a) A double acting cylinder is to be operated continuously to & fro. Draw a hydraulic circuit without solenoid valves and explain the operation. **[12]**

b) Write the essential steps to design a fluid . **[4]**

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