

GANPAT UNIVERSITY
B.TECH VI SEM MECHATRONICS ENGINEERING
REGULAR EXAMINATION MAY/JUNE-2012
MC 603 HYDRAULICS & PNEUMETICS SYSTEM

TIME – 3 HOURS

TOTAL MARKS- 70

- INSTRUCTION:-
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Make suitable assumptions wherever necessary.

Section –I

- Q-1 (a) What is a positive displacement pump? Differentiate with non positive displacement pump. [12]
- (b) Difference between external gear pump and internal gear pump. What type of gear is generally used in gear pumps? State them.
- (c) What are the factors to be considered for the selection of hydraulic pumps? Explain in brief.
- OR
- Q-1 (a) State the Pascal law and the law of conservation of energy give application of both laws. [12]
- (b) Why pressure compensation is required in vane pumps? How is it done?
- (C) Explain Hydraulics Oil conditioning equipments in brief.
- Q-2 (a) Write down various styles of cylinder mounting. What is a clevis joint? [11]
- (b) State the basic reason for cylinder component wear. What are the factors on which the wear rate depends?
- (C) Explain meter-in and meter-out circuit.
- OR
- Q-2 (a) Explain the construction and function of swash plate motor. [11]
- (b) Through a hydraulic pipe of 16 mm dia working at a pressure of 47 kgf/m² flows oil at a flow rate of 13 l/min Find out flow velocity and power.
- (C) Explain in detail hydro-pneumatic accumulators.
- Q-3 **Attempt Any three.** [12]
- (a) Single cylinder automatic reciprocating by using sequence valve.
- (b) Different central position of direction control valve and its application.
- (c) What is check valves? Draw the construction of pilot operated check valve. And application of check valve.
- (d) What is throttle valve? Draw the figure of throttle valve.

Section –II

- Q-4 (a) Explain basic system element in pneumatic control system with figure. [12]
(b) Operating double acting cylinder automatically.
(c) Suggest Application of power sources (Hydraulics or Pneumatics) and reason for it.
- Automobile wheel changing.
 - To handling Pre-cast RCC underground bridges.
 - Sheet metal punching
 - Robot Gripper
 - In forging industries

OR

- Q-4 (a) Briefly explain how to designate the solenoid DCV. Give three examples with figure. [12]
(b) Draw pneumatic circuits for quick return of cylinder during idle stroke.
(c) Explain wall attachment principal and logical valves (flip-flop, NOR) application in pneumatic circuits.

- Q-5 (a) Discuss the time delay valve with construction and its symbol. [11]
(b) Draw and explain an electro-pneumatic circuit for automatic reciprocating double acting cylinder using a limit switch. A circuit should use double side solenoid DCV and relay. Draw also electrical diagram separately.
(c) Discuss in detail about relay and switch for operating electro-pneumatic circuit.

OR

- Q-5 (a) What is the importance of air filter unit in pneumatic system draw and explain its construction with symbol. [11]
(b) Draw function Diagram of Separating color cubes from conveyors to Different three color bin.
(c) Explain the construction of AND valve with neat sketch.

- Q-6 **Attempt Any three.** [12]
(a) Design a pneumatic circuit diagram for a clamping device having variable clamping forces.
(b) Make a pneumatic circuit for indirect control of a single acting cylinder and double acting cylinder using pilot operated DCV.
(c) Explain construction, application and location of FRL unit.
(d) Explain twin lobe rotary compressor with figure.

*****END OF PAPER*****