USN | | | | | | | | | |
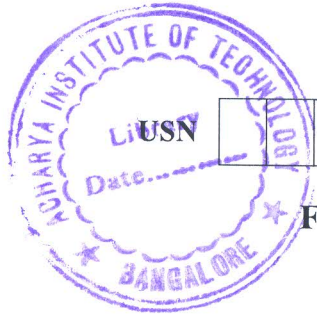
10MT53

Fifth Semester B.E. Degree Examination, June/July 2019
Hydraulics and Pneumatics

Time: 3 hrs.   Max. Marks:100

**Note: *Answer any FIVE full questions, selecting
at least TWO full questions from each part.***

PART – A

1   a. State Pascal's law. Explain with neat sketch the basic hydraulic power system.   **(06 Marks)**
    b. Determine the volumetric efficiency of a gear pump of External and Internal dia of gears 75mm and 50mm respectively and width of the gear teeth 50mm, if the actual discharge is 30 LPM at 1800 rpm.   **(04 Marks)**
    c. Explain the operation of a Internal gear pump with a neat sketch.   **(10 Marks)**

2   a. A hydraulic motor has a displacement of 125cm^3 operating at a pressure of 100 bars and speed of 1800 rpm. If the actual flow rate of the motor is 0.004m^3/sec and the actual torque delivered by the motor is 250 N-m, find the mechanical efficiency, volumetric efficiency and overall efficiency and thermal power delivered by the motor.   **(10 Marks)**
    b. List the advantages and disadvantages of hydraulic motors in comparison with electric motors.   **(04 Marks)**
    c. Why cushioning is needed in a hydraulic cylinder? With a neat sketch, explain end cushioning in hydraulic cylinders.   **(06 Marks)**

3   a. Explain briefly with neat diagram the working principle of 4 – way and 3 – way directional control valve and also draw its graphical symbols.   **(10 Marks)**
    b. Explain briefly with neat figure the working of pressure compensated and temperature compensated flow control valves.   **(10 Marks)**

4   a. With neat hydraulic circuit diagram, explain the working of double pump hydraulic system and list any 2 application.   **(10 Marks)**
    b. What is Accumulator? List its types and explain application of accumulator with any hydraulic circuit.   **(10 Marks)**

PART – B

5   a. Explain briefly the desirable properties of hydraulic fluids.   **(10 Marks)**
    b. What are the functions of seals in hydraulic system? Explain four types of Dynamic seals, with neat sketch.   **(10 Marks)**

6   a. Explain briefly with neat figure End position cushioning of pneumatic actuator.   **(10 Marks)**
    b. Discuss briefly the types of seals and mounting arrangements of pneumatic actuators.   **(10 Marks)**

7   a. Explain the working of quick exhaust and twin pressure valve with neat figure.   **(10 Marks)**
    b. Using two-way-two position direction control valves, show how the following logic functions can be achieved in pneumatics:
       i) AND   ii) NOR   iii) OR   iv) NAND   **(10 Marks)**

8   a. With example, explain the cascading-method of pneumatic circuit design.   **(10 Marks)**
    b. Write short notes on:
       i) Air filters   ii) Air driers   iii) Air lubrication unit.   **(10 Marks)**

* * * * *