USN | | | | | | | | | | | **15AU554**

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Hydraulics and Pneumatics

Time: 3 hrs.   Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1. a. State Pascal's law. Explain its applications, with a neat sketch. **(04 Marks)**
   b. With a neat sketch, explain the construction and working of an external gear pump. **(06 Marks)**
   c. A pump having a displacement of $25cm^3$, operates with a pressure of 250 bar and speed of 1390 rpm , Volumetric efficiency of 0.85 and Mechanical efficiency of 0.80. Calculate
   i) Pump delivery in LPM   ii) Input power at pump shaft in KW   iii) Drive torque at pump shaft. **(06 Marks)**

OR

2. a. Explain the construction and working of a Double acting hydraulic cylinder with a neat sketch. **(06 Marks)**
   b. With neat sketches, explain First , Second and Third class lever system. **(10 Marks)**

Module-2

3. a. Explain the operation of a simple pressure relief valve with a neat sketch. Also draw the graphic symbol. **(08 Marks)**
   b. Explain Pressure Compensated Flow control value, with a neat sketch. Also draw the graphic symbol. **(08 Marks)**

OR

4. a. What are the desirable properties of a hydraulic fluid? Explain briefly any five of them. **(08 Marks)**
   b. Sketch and explain the "Reservoir System". **(08 Marks)**

Module-3

5. a. Explain briefly the principle involved in a regenerative circuit. **(06 Marks)**
   b. Explain with suitable circuits how single acting and double acting cylinders are controlled. **(10 Marks)**

OR

6. a. What are Hydraulic Accumulators? Classify the different accumulators used in hydraulic systems. **(04 Marks)**
   b. With a hydraulic circuit diagram, explain meter – in and meter – out speed control of hydraulic actuators. **(12 Marks)**

Module-4

7. a. Explain the following with neat sketches : **(08 Marks)**
   i) Pneumatic cylinder cushioning   ii) Seals for static and dynamic application.
   b. Sketch and explain a Rod – less cylinder. **(08 Marks)**

OR

8 a. Differentiate between direct and indirect actuations of pneumatic cylinders. (08 Marks)
   b. Explain with a suitable circuit diagram, a Quick exhaust valve. (08 Marks)

Module-5

9 a. Explain Signal elimination using reversing valves. (08 Marks)
   b. With a neat circuit diagram, explain Electropneumatic control of a single acting cylinder. (08 Marks)

OR

10 Write short notes on :
   a. Solenoids.
   b. Air filters.
   c. Air Driers.
   d. Motion Diagrams. (16 Marks)

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