

BACHELOR OF VOCATION
Robotics and Automation
Subject: Hydraulics & Pneumatics
Subject Code: ME-605
Semester: Third
January 2021
Theory (External): 35 Marks
Time: 03 Hours

Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number										

SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

- A. The resistance offered to the flow of fluid inside a piston develops into
- Pressure
 - Force
 - Stress
 - all of the above
- B. In hydraulic systems
- the mechanical energy is transferred to the oil and then converted into mechanical energy
 - the electrical energy is transferred to the oil and then converted into mechanical energy
 - the mechanical energy is transferred to the oil and converted into electrical energy
 - none of the above
- C. Rotary motion in a hydraulic power unit is achieved by using
- hydraulic cylinder
 - pneumatic cylinder
 - both hydraulic and pneumatic cylinder
 - none of the above
- D. What is the function of electric actuator?
- converts electrical energy into mechanical torque
 - converts mechanical torque into electrical energy
 - converts mechanical energy into mechanical torque
 - none of the above
- E. Which stage in two stage direction control valve is solenoid operated?
- main stage direction control valve
 - pilot stage direction control valve
 - both stages in two stage direction control are solenoid operated
 - none of the above

- F. Which valve is used to block the accumulator from the system for the purpose of safety?
- a) pilot valve
 - b) needle valve
 - c) detent valve
 - d) all of the above
- G. What is the function of a flow control valve?
- a) flow control valve changes the direction of oil flow
 - b) flow control valve can adjust the flow rate of hydraulic oil
 - c) both a. and b.
 - d) none of the above
- H. Where is an intercooler connected in a two-stage compressor?
- a) intercooler is connected after the two-stage compressor
 - b) intercooler is connected between the two-stages of the compressor
 - c) intercooler is connected before the two-stage compressor
 - d) none of the above
- I. Head loss h_f due to friction is given by
- a) $4 f l v^2 / g d$
 - b) $4 f^2 l v / 2 g d$
 - c) $2 f l v^2 / 2 g d$
 - d) $4 f l v^2 / 2 g d$
- J. Pressure drop in pipes, occurs due to
- a) frictional resistance
 - b) load
 - c) flow pattern
 - d) none of the above

SECTION -B (ESSAY TYPE QUESTIONS)

(5x5=25 Marks)

1. Discuss with neat sketch the components of basic hydraulic system and its functions.
2. Briefly Discuss an operation of a manually operated hydraulic jack.
3. Write short notes about types of fluids used in the fluid power systems.
4. Describe the cushion assembly for a pneumatic cylinder.
5. Explain the construction of pressure relief valve with neat sketch.
6. Explain the types of Directional control valve and its construction and operation.
7. Describe with a suitable circuit diagram:
 - (i) Shuttle valve
 - (ii) Quick exhaust valve.
8. Explain in detail about Various selection criteria for pneumatic components.

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