

BACHELOR OF VOCATION
Tool and Die Manufacturing
Subject: Pneumatics & Hydraulics
Subject Code: CBME-305
Semester: Fifth
January 2021
Theory (External): 35 Marks
Time: 03 Hours

210187

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

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SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)

(10x1=10 Marks)

- A Write the statement of Pascal's Law and it's applications (at least two).
- B Two pipes of diameters d_1 and d_2 converge to form a pipe of diameter d . If the liquid flows with a velocity of v_1 and v_2 in the two pipes, what will be the flow velocity in the third pipe?
- $\frac{d_1 v_1 + d_2 v_2}{d}$
 - $\frac{d^2(v_1 + v_2)}{d}$
 - $\frac{(d_1 + d_2)^2(v_1 + v_2)}{d^2}$
 - $\frac{d_1^2 v_1 + d_2^2 v_2}{d^2}$
- C In a two dimensional flow, the component of the velocity along the X-axis and the Y-axis are $u = axy$ and $v = bx^2 + cy^2$. What should be the condition for the flow field to be continuous?
- $a + b = 0$
 - $a + c = 0$
 - $a + 2b = 0$
 - $a + 2c = 0$
- D Pumps used in hydraulic applications are
- Positive displacement pumps
 - Variable displacement pumps
 - Fixed displacement pumps
 - All the above
- E Which of the following is used as a component in hydraulic power unit?
- | | |
|-------------------|--------------|
| a) Pressure gauge | b) Valve |
| c) Filler gauge | d) Reservoir |

- F When comparing operating cost of hydraulic systems to pneumatic systems, generally they are
- More expensive to operate
 - Less expensive to operate
 - Cost is same to operate
 - Cost is not required
- G In pneumatic systems, AND gate is also known as
- Check valve
 - Shuttle valve
 - Dual pressure valve
 - None of the above
- H The scientific principle that makes hydraulic systems possible is
- Pascal's principle
 - Boyle's law
 - Bernoulli's principle
 - The fluid flow principle
- I Pneumatic and other power systems can support three kinds of motion; they are
- Linear, reciprocating, and random motion
 - Linear, flowing, and rotary motion
 - Linear, zigzag, and spiral motion
 - Linear, reciprocating, and rotary motion
- J Which of the following statements are true for the throttle valve?
- Reverse flow of fluid is not possible
 - Input pressure for a throttle valve is more than output pressure
 - The actuator speed can be reduced by a throttle valve
 - Correct flow control valve for a particular application can be selected on the basis of pressure drop specified
- 1, 2 and 3
 - 1, 3 and 4
 - 2, 3 and 4
 - all the above

SECTION -B (ESSAY TYPE QUESTIONS)
(5x5=25 Marks)

- Q1 Discuss the various types of pumps used in hydraulic drives.
- Q2 Why pneumatic drives are not commonly used for machine tool drives? List the various advantages and disadvantages of pneumatic devices.
- Q3 Describe the general norms for designing a hydraulic circuit.
- Q4 Classify the reciprocating air compressor. Explain the working principle of the type with neat sketch.
- Q5 Explain the type of control valves for hydraulic devices and write their applications.
- Q6 Differentiate between absolute and kinematic viscosity. List some of the fire resistant fluids used in hydraulic industry.
- Q7 List the six basic components used in a pneumatic system. Explain one of them in detail with diagram.
- Q8 Name three reasons for considering the use of pneumatics instead of hydraulics.

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