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**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - NOV 2023**

Semester : Semester VII - 2020

Course Code : MEC3062

Course Name : Sem VII - MEC3062 - Hydraulics and Pneumatics

Program : B. TECH

Date : 3-NOV-2023

Time : 2:00PM - 3:30PM

Max Marks : 60

Weightage : 30%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. Define Actuators and also give one example of Actuator. (CO1) [Knowledge]
2. Define Volumetric Efficiency. (CO1) [Knowledge]
3. Draw 2/4 way Valve symbol.(Line Diagram) (CO1) [Knowledge]
4. Explain Pascal's Law. (CO2) [Knowledge]
5. Define Pneumatics System. (CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(2 X 15 = 30M)

6. A pump supplies oil at 0.0016 m³ /s to a 40 mm diameter double-acting hydraulic cylinder. If the load is 5000 N (extending and retracting) and the rod diameter is 20 mm, Find the:
(a) Hydraulic pressure during the extending stroke. (b) Piston velocity during the extending stroke. (c) Cylinder kW power during the extending stroke. (d) Hydraulic pressure during the retracting stroke, (e) Piston velocity during the retracting stroke. (CO1) [Comprehension]

7. a) In the hydraulic press , a force of 100 N exerted on the small piston. Determine the upward force on the large piston. The diameter of smaller piston is 50 mm and the diameter of the large piston is 145 mm. Also find the distance moved by the large piston if the small piston moves by 100 mm. Assume cross-section of piston to be circular. Also sketch the required diagram.
b) Also explain pascal's law with the help of above numerical.

(CO2) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

8. Explain the Construction and working of the following with diagram:
a) Vane Pump
b) Gear Pump

(CO1) [Application]