Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023

Semester : Semester IV - 2021
Course Code : MEC3062
Course Name : Sem IV - MEC3062 - Hydraulics and Pneumatics
Program : ISR

Date : 12-APR-2023
Time : 2PM - 3.30PM
Max Marks : 50
Weightage : 25%

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. Give reason why hydraulic systems are slower in operation.

(CO1) [Knowledge]

2. Hydraulic lifts and hydraulic brakes are based on which law, State the law.

(CO1) [Knowledge]

3. State any four advantages of Hydraulic system

(CO1) [Knowledge]

4. Briefly explain 4/3 way DCV.

(CO2) [Knowledge]

5. What does 4 by 2 directional control valve mean?

(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(5 X 4 = 20M)**

6. In the hydraulic press shown below, a force of 100 N is exerted on the small piston. Determine the upward force on the large piston. The area of the small piston is 50 x 102 mm2 and the area of the large piston is 500 x 102 mm2. Also, find the distance moved by the large piston if the small piston moves by 100 mm.

(CO1) [Comprehension]

7. A gear pump has a 30mm outside diameter, a 20 mm inside diameter, and a 10 mm width. If the actual pump flow at 1800 rpm and rated pressure is 20 bar, what is the volumetric efficiency?

(CO1) [Comprehension]

8. A gear pump is a positive displacement (PD) type. It moves a fluid by repeatedly enclosing a fixed volume using interlocking cogs or gears, transferring it mechanically using a cyclic pumping action. A gear pump has an outside diameter of 82.6 mm, an inside diameter of 57.2 mm, and a width of 25.4 mm. What is the volumetric efficiency if the actual pump flow is 1800 RPM and the rated pressure is 0.00183 3 m /s?

(CO2) [Comprehension]

9. Breifly explain advanatge and disadvantage of directional control valve.

(CO2) [Comprehension]

10. Define Pump. Also classify its type with brief explanation.

(CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **(2 X 10 = 20M)**

11. Generalize the expression for overall pump efficiency.

(CO1) [Application]

12. Discuss the characteristics of Centrifugal pumps used in general applications.

(CO2) [Application]