PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023

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

Date : 16-JUN-2023
Time : 9.30AM - 12.30PM
Max Marks : 100
Weightage : 50%

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. Briefly explain 5/2 way solenoid operated Directional control valve.

                                                                (CO2) [Knowledge]

2. State any four advantages of Hydraulic system

                                                                (CO1) [Knowledge]

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

                                                                (CO1) [Knowledge]

4. Define 2/2 way Directional control valve.

                                                                (CO2) [Knowledge]

5. Give reason why hydraulic systems are slower in operation.

                                                                (CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS   **(5 X 10 = 50M)**

6. Define Poppet valve (Check Valve) with neat sketch. Also briefly mention its advantages and disadvanatges.

                                                                (CO2) [Comprehension]

7. What is Hydraulic System? Breifly explain the component of hydraulic system. Also write its Advantages and Limitations.

(CO1) [Comprehension]

8. Define Meter-in circuit method. Briefly explain and draw the diagram for meter-in ciruit for reverse stroke.

(CO3) [Comprehension]

9. A pump supplies oil at 0.0016 cubic meter per second to a 50 mm diameter double acting hydraulic cylinder. If the load is 10000 N (extending and retracting) and rod diameter is 30 mm find then determine.
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 retracting stroke
e) Piston velocity during the retraction stroke
f) Cylinder KW power during the retraction stroke

(CO2) [Comprehension]

10. What is coordinated motion control ? Briefly explain the lifting and shifting operation with its position step diagram using pneumatic system.

(CO4) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS   (2 X 20 = 40M)

11. With an example the control of a pneumatic double acting cylinder using two electrical power sources of 0V and 24V enabled DCV. This is used to draw molten metal by raising and lowering of the ladle in a smelting crucible. Also note that speed of raising is around 23% and lowering is 36% which should be adjusted separately.

(CO3) [Application]

12. With neat sketch of Pneumatic control system and pneumatic cylinders explain pneumatic sytem. Also briefly explain the advantages and disadvantages of pneumatic system with its different application.

(CO4) [Application]