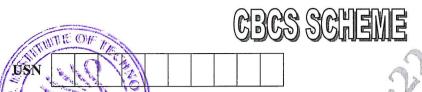
Time: 3 hrs



18ME55

Fifth Semester B.E. Degree Examination, July/August 2022
Fluid Power Engineering

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

## Module-1

- a. What are the main components of hydraulic system? Write with neat sketch explain hydraulic system. (08 Marks)
  - b. What do you mean by static and dynamic seal? Mention sealing materials used. (06 Marks)
  - c. What are the desirable properties of a fluid explain any five? (06 Marks)

#### OR

- 2 a. Define Pascal's Law? With neat sketch, explain for any one application. (06 Marks)
  - b. Mention some advantages and disadvantages of fluid power system. (08 Marks)
  - c. For a simple hydraulic Jack the following data is given, force on pump piston is 100N, area of pump piston is 50cm<sup>2</sup>, displacement of pump piston is 10cms, find force and area of load cylinder that carries also find energy input and energy output. Take area of load cylinder 500cm<sup>2</sup>. (06 Marks)

# Module-2

- a. Give the classification of pumps. With neat sketch explain balanced vane pump. (08 Marks)
  - b. With neat sketch explain construction of external gear motor. (06 Marks)
  - c. A vane pump have volumetric displacement 115cm<sup>2</sup>. It has a rotor diameter of 63.5mm, a cam ring diameter of 88.9mm and a vane width of 50.8mm, find the eccentricity. (06 Marks)

### OR

- 4 a. With neat sketch explain bent axis types axial piston pump. Derive the equation for theoretical flow rate. (10 Marks)
  - b. Find the flow rate in ltr/sec that an axial piston pump delivers at 1000 RPM. The pump has 9 numbers 15mm diameter piston arranged on a 125mm diameter piston circle. The offset angle is set at 10° and the volumetric efficiency is 94%. (10 Marks)

## Module-3

- 5 a. With neat sketch explain solenoid actuated 4/3 direction control valve. (06 Marks)
  - b. With neat sketch explain Shuttle valve. (06 Marks)
  - c. With neat sketch explain circuit used for punching operation. (08 Marks)

#### OR

- 6 a. With neat sketch explain non compensated flow control valve, with symbol. (08 Marks)
  - b. Explain the regenerative circuit with diagram. Derive the equations for velocity. (12 Marks)

### Module-4

- 7 a. With a neat diagram, explain the structure of pneumatic system.

  b. Explain different types of cylinder cushioning. (06 Marks)
  - c. What are the characteristics of compressed air? (06 Marks)

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		OR	
8	a.	Differentiate between hydraulic system and pneumatic systems.	(06 Marks)
	b.	With neat sketch explain FRL unit with symbol	(08 Marks)
	c.	With a circuit diagram explain	
		i) Quick exhaust valve	
		ii) Time delay valve.	(06 Marks)
		Module-5	
9	a.	Explain OR and AND gates in pneumatic systems with circuits.	(10 Marks)
	b.	With neat sketch and symbol explain 2/2 poppet valve.	(06 Marks)
	c.	What are the two types of air Throttling? Differentiate between them.	(04 Marks)
		OR CMRIT LIBRARY BANGALORE - 560 037	
10	a.	What are the rules to be followed to draw a motion diagram?	(06 Marks)
	Ъ.	With a neat diagram, explain signal flow pneumatic structure.	(08 Marks)
	c.	Briefly explain about relay and contactors.	(06 Marks)