

--	--	--	--	--	--	--	--	--	--

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024 Hydraulics and Pneumatics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain how bent axis motor differs with axial motor with schematic sketches. (10 Marks)
- b. Explain the working of internal gear pump with a neat sketch. (10 Marks)

OR

- 2 a. A hydro static transmission operating at 10MPa has the following data :

Hydraulic pump	Hydraulic motor
$V_D = 100\text{cm}^3$	$V_d = ?$
$\eta_{\text{vol}} = 90\%$	$\eta_{\text{vol}} = 92\%$
$\eta_{\text{mesh}} = 85\%$	$\eta_{\text{mesh}} = 87\%$
$N = 1500\text{rpm}$	$N = 700\text{rpm}$

- Calculate the following : i) Displacement of the motor ii) Output torque to motor. (10 Marks)
- b. Explain pressure compensated vane pump. with a neat sketch. (10 Marks)

Module-2

- 3 a. Explain with a neat diagram, the working of a compound relief valve. (10 Marks)
- b. Explain how a pressure compensated flow is obtained through a flow control valve, with the help of a neat diagram. (10 Marks)

OR

- 4 a. Explain with neat sketch of 3/2 poppet valve with symbolic representation. (10 Marks)
- b. Explain with a neat sketch the working of shuttle valve with symbolic representation. (10 Marks)

Module-3

- 5 a. Explain how speed of a hydraulic cylinder is controlled using a regenerative hydraulic circuit. (10 Marks)
- b. Sketch the hydraulic circuit for use of accumulator as an auxillary power source and explain its working. (10 Marks)

OR

- 6 a. Explain with a neat circuit diagram, the working of double pump hydraulic system. (10 Marks)
- b. Explain with neat circuit diagram, the counter balance valve application. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. Explain with neat sketches the working of full flow and by-pass filters. (12 Marks)
b. Write note about service properties of hydraulic fluids. (08 Marks)

OR

- 8 a. Explain the working of cylinder cushioning with a neat sketch. (10 Marks)
b. Describe the structure of pneumatic control with a block diagram. (10 Marks)

Module-5

- 9 a. Explain the classification of pneumatic valves. (05 Marks)
b. Explain OR and AND logic gates with a neat sketch. (10 Marks)
c. Write a short note on Time delay valve. (05 Marks)

OR

- 10 a. Explain the following electrical contractors of switches used in electro pneumatic system.
i) Push button
ii) Limit switch
iii) Pressure switch
iv) Temperature switch (08 Marks)
b. Explain three basic types of FCV with suitable diagram. (06 Marks)
c. Explain the difference between check valve and shuttle valve. (06 Marks)
