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Fifth Semester B.E. Degree Examination, Jan./Feb. 2023
Fluid Power Engineering

Max. Marks: 100

Time: 3 hrs.

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

Module-1

- 1 a. With a block diagram, explain hydraulic system. (07 Marks)
b. Give the differences between hydraulic system and pneumatic system. (07 Marks)
c. Explain Pascal's law. (06 Marks)

OR

- 2 a. With the help of sketch explain filter position in a hydraulic system. (07 Marks)
b. With a neat sketch, explain water cooled heat exchanger. (07 Marks)
c. Write a note on Seals. (06 Marks)

Module-2

- 3 a. With a neat sketch, explain internal gear pump. (07 Marks)
b. A pump having a displacement volume of 90cm^3 delivers $0.082\text{m}^3/\text{min}$ at 1000rpm and 6.9MPa. If the input torque is 102Nm. Find
i) Overall efficiency of the pump
ii) Theoretical torque required to operate the pump (07 Marks)
c. With a neat sketch, explain diaphragm type gas loaded accumulator. (06 Marks)

OR

- 4 a. With a neat sketch, explain hydraulic cylinder cushioning. (07 Marks)
b. A hydraulic motor has a 100cm^3 volumetric displacement. If it has a pressure rating of 140 bars receives oil from a $0.001\text{m}^3/\text{s}$ theoretical flow rate pump, find motor
i) Speed
ii) Theoretical torque
iii) Theoretical power (08 Marks)
c. With a neat sketch, explain rotary actuator. (05 Marks)

Module-3

- 5 a. With a sketch, explain 3 position 4 way direction control valve. (08 Marks)
b. Explain working of unloading valve (07 Marks)
c. Explain working of shuttle valve. (05 Marks)

OR

- 6 a. With the help of circuit diagram, explain sequencing of cylinder. (08 Marks)
b. Explain metering in and metering out circuits. (12 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. List the advantages, disadvantages and applications of Pneumatic system. (08 Marks)
b. With a neat sketch, explain F.R.L unit in a pneumatic system. (12 Marks)

OR

- 8 a. With a neat labelled sketch explain parts of pneumatic double acting cylinder. (07 Marks)
b. With a neat sketch, explain quick exhaust valve. (07 Marks)
c. Explain working of reciprocating air compressor. (06 Marks)

Module-5

- 9 a. With circuit diagram, explain indirect control of single acting cylinders. (08 Marks)
b. Explain 'OR' and 'AND' logic gates. (08 Marks)
c. Write a note on pneumatic throttle valve. (04 Marks)

OR

- 10 a. Explain with circuit coordinated cylinder movements. (10 Marks)
b. With a neat sketch, explain solenoid controlled direction control valve. Mention advantages. (10 Marks)
