

# ONE TIME EXIT SCHEME

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10ME73

## Seventh Semester B.E. Degree Examination, April 2018 Hydraulics and Pneumatics

Time: 3 hrs.

Max. Marks: 100

**Note:** Answer any FIVE full questions, selecting atleast TWO questions from each part.

### PART – A

- 1 a. Define hydraulic system. What are its advantages and disadvantages? (06 Marks)
- b. Draw a structure of hydraulic system and explain the parts. (08 Marks)
- c. For a simple hydraulic jack the following data is given  $F_1 = 100 \text{ N}$ ,  $A_1 = 50 \text{ cm}^2$ ,  $S_1 = 10 \text{ cms}$ . Find load  $F_2$  and displacement  $S_2$  if area of piston that is to be lifted is  $500 \text{ cm}^2$ . Also find energy input and energy output. [Refer Fig.Q1(c)]

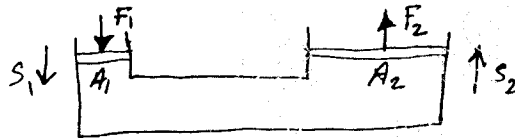


Fig.Q1(c)

(06 Marks)

- 2 a. Give the classification of pumps. With a neat sketch explain swash plate type piston pump. (08 Marks)
- b. A pump has a displacement of  $98.4 \text{ cm}^3$ . It delivers  $0.00152 \text{ m}^3/\text{s}$  of oil at 1000 RPM and 70 bar. If the prime mover input torque is 124.3 Nm. Find: (i) Overall efficiency of pump; (ii) Theoretical torque required to operate the pump. (08 Marks)
- c. With a neat sketch, explain external gear pump. (04 Marks)
- 3 a. Give the classification of hydraulic control valve. With a neat sketch, explain simple pressure relief valve and give its graphical symbol. (10 Marks)
- b. Explain compensated and non-compensated flow control valve. Also draw the symbol. (10 Marks)
- 4 a. With a neat sketch, explain pump unloading circuit. (10 Marks)
- b. With a neat sketch, explain hydraulic cylinder sequencing circuit used in hydraulic drill press. (10 Marks)

### PART – B

- 5 a. What are the desirable properties of hydraulic oils? (06 Marks)
- b. Sketch and explain different filtering systems in a circuit. (08 Marks)
- c. Explain what are the causes for wear in hydraulic system. (06 Marks)
- 6 a. With a neat sketch explain structure of pneumatic system. (06 Marks)
- b. Write a neat sketch explain FRL unit. (08 Marks)
- c. With a neat sketch explain rod-less cylinder. (06 Marks)
- 7 a. Explain with a neat sketch, (i) time delay valve (ii) shuttle valve. (10 Marks)
- b. Explain OR and AND gates used in pneumatic system. (10 Marks)
- 8 Write short notes on the following: (20 Marks)
  - a. Poppet valve
  - b. Solenoid valve
  - c. Cascading method
  - d. Air driers

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