

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2543

Roll No.

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B. Tech.

(SEM VI) THEORY EXAMINATION 2010-11

PNEUMATICS AND HYDRAULICS

Time : 3 Hours

Total Marks : 100

Note : (i) Answer **all** questions. All questions carry equal marks.

(ii) Assume missing data suitably, if any.

1. Attempt any **two** of the following. (10×2=20)

(a) What are the primary functions of a hydraulic fluid? Name ten properties that a hydraulic fluid should possess and discuss any three of these.

(b) Discuss the factors to be considered for selecting a hydraulic pump for a specific application. A pump having a 95% volumetric efficiency delivers 29 lpm of oil at 1000 rpm. Find the volumetric displacement of the pump.

(c) Answer the following :

(i) What is solenoid? How does it work?

(ii) What is a check valve? How does pilot check valves differ from a simple check valve?

2. Attempt any **two** of the following : (10×2=20)

- (a) Discuss the working of electro-hydraulic servo valve with neat sketch.
- (b) What do you understand by hydraulic accumulator ? List the basic applications and different types of accumulator. Determine the size of accumulator necessary to supply 5 litre of oil between pressure of 200 bar and 100 bar. Assume an accumulator pre-charge pressure of 90 bar.
- (c) Answer the following :
 - (i) Differentiate with sketches the function and characteristics of closed centre and open centre directional control valve.
 - (ii) What is sequence valve ? What is its purpose ?

3. Attempt any **two** of the following : (10×2=20)

- (a) Draw a hydraulic circuit diagram of a hydraulic system having a double acting cylinder which has rapid approach speed, then a slow feed motion and at the end of the stroke the cylinder return rapidly.
- (b) Answer the following :
 - (i) What is meant by air-over-oil system ?
 - (ii) What is a cartridge valve ? What are the benefits of using cartridge valve ?

(c) Answer the following:

- (i) What is functional diagram ? How it differs from a circuit diagram ?
- (ii) What do you understand by fail safe circuit ?

4. Attempt any **two** of the following : (10×2=20)

- (a) Describe the function of air pressure regulator and air filter in pneumatic circuits.
- (b) What do you understand by pneumatic vacuum system ? State its application.
- (c) Write short notes on
 - (i) Air lubricators
 - (ii) Multistage compressor.

5. Attempt any **four** of the following : (5×4=20)

- (a) What are moving port logic devices ?
- (b) Discuss the application of PLCs in fluid power control.
- (c) Draw the logic circuit of EXCLUSIVE-OR function.
- (d) Discuss the working of limit switches.
- (e) Define the term closed loop transfer function.
- (f) Discuss the function of oil intensifier.