T 8254

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2006.

Fifth Semester

Mechanical Engineering

ME 1305 — APPLIED HYDRAULICS AND PNEUMATICS

(Common to B.E. (Part-Time) Fourth Semester R-2005)

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Fluid Power.

2. Explain the term friction factor.

3. What do you mean by non positive displacement pump? State its implications.

4. What is cylinder cushion? What is its purpose?

5. Differentiate between pressure control valve and pressure relief valve.

6. Write the functions of a solenoid valve.

7. What is the need of lubricator unit in the pneumatic system?

8. Name the various types of filters used in the pneumatic system.

9. What is servo valve? How does it work?

10. Define Coanda effect.

PART B — (5 × 16 = 80 marks)

11. (a) (i) With neat sketch explain the hydraulic and pneumatic fluid power systems. (12)

(ii) Discuss the properties of the hydraulic fluids. (4)

Or

(b) (i) How to calculate frictional losses in common valves and fittings. (8)

(ii) Define Reynolds number. (2)

(iii) Differentiate between laminar and turbulent fluid flow. (6)

12. (a) (i) Explain the working principle of external gear pump and determine its performance measures. (12)

(ii) Write short notes on variable displacement pumps. (4)

Or

(b) Explain the various mechanisms of hydraulic cylinder mountings with neat diagram. (16)

13. (a) (i) Explain the operational features of the check valve with neat diagram. (10)

(ii) Write short notes on shuttle valve. (6)

Or

(b) (i) Explain air over oil intensifier system with suitable example. (10)

(ii) With neat sketch explain the weight loaded accumulator. (6)

14. (a) What is compressor? Explain the working principle of piston type compressor with neat sketch. (16)

Or

(b) What is synchronizing? Explain the synchronizing circuit with suitable approaches. (16)

15. (a) Explain the hydro mechanical servo system with suitable application. (16)

Or

(b) How PLC is used in fluid power control? Explain with a suitable application. (16)
