Question Paper Code : 11531

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Fifth Semester

Mechanical Engineering

ME 2305/ME 55/ME 1305/10122 ME 506/080120027 — APPLIED HYDRAULICS AND PNEUMATICS

(Common to 080120027 — Hydraulics and Pneumatics Systems)

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Under what conditions pneumatic systems are preferred?

2. List the primary functions of hydraulic fluid.

3. What is a balanced vane pump?

4. Name the different types of cylinder mountings.

5. What is the function of unloading valve and sequence valve?

6. What is an intensifier and where is it used?

7. What is a power pack?

8. What is the functions of air filter and dryer?

9. Differentiate pressure switch and temperature switch.

10. When to use timer and relay? Why?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Write the advantages and applications of fluid power with respect to machine tool applications. (10)

(ii) How to select oil for the industrial application? (6)

Or

(b) (i) Write short notes on :

(1) Laminar and turbulent flow

(2) Darcy-Weisbach equation. (8)

(ii) What is moody diagram? Explain the important characteristics of its. (8)

12. (a) (i) Explain the construction and working of an swash plate type piston pump with neat sketch. (12)

(ii) Write a short note on Telescopic cylinder. (4)

Or

(b) (i) Explain the working of a gear type motor and vane type motors. (12)

(ii) Explain the cushioning of cylinder. (4)

13. (a) (i) Explain the working of a pilot operated pressure relief valve with neat sketch. (8)

(ii) Explain the use of counter-balance valve with a circuit. (8)

Or

(b) (i) Explain the different types of accumulator with neat sketch. (12)

(ii) Explain the commonly used electrical control devices in fluid power systems. (4)

14. (a) (i) With a neat sketch explain the working of piston compressor. (8)

(ii) Explain meter-in and meter-out circuits with neat sketch. (8)

Or

(b) Design an electro pneumatic circuit using cascade method for the following sequences $A^+B^+B^-A^-C^+C^-$. (16)

15. (a) (i) Explain the electro hydraulic servo system with a neat sketch. (8)

(ii) Draw and explain the ladder diagram for electrical control of regenerative circuit. (8)

Or

(b) (i) Explain the major components of PLC with a block diagram. (10)

(ii) Compare the ladder diagram of electrical circuit and PLC circuit. (6)