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Question Paper Code : 21858

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Fifth Semester

Mechanical Engineering

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

(Common to Sixth Semester Mechatronics Engineering and Fifth Semester Mechanical and Automation Engineering)

(Also common to 080120027 – Hydraulics and Pneumatics Systems)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why is hydraulic power especially used for heavy work?
2. Name any four draw backs of fluid power systems.
3. Distinguish between fixed displacement and variable displacement pumps?
4. What is cavitations? How can it be eliminated?
5. Draw the symbol for a pressure relief valve and pressure reducing valve.
6. What is meant by 'pressure compensation' in a flow control valve?
7. What is the need for mufflers?
8. Name the different types of air motors.
9. List the various methods used for designing logic circuits?
10. Explain why interfacing is necessary in a microprocessor control of fluid power?

PART B — (5 × 16 = 80 marks)

11. (a) (i) List the desired properties of hydraulic fluids. (8)
(ii) What are the components required for basic hydraulic systems? Also mention their functions. (8)

Or

- (b) (i) List the applications of fluid power systems employed in industries. (8)
(ii) How can you measure the frictional losses in laminar flow and turbulent flow? (8)
12. (a) (i) Describe the working principle of pressure compensated variable displacement vane pump. (10)
(ii) Mention the role of a pump in a hydraulic system and how its classify. (6)

Or

- (b) (i) Explain the 'end cushion' provided in hydraulic cylinder with a neat sketch. (8)
(ii) How torque is developed in a gear motor explain with neat sketch. (8)
13. (a) (i) Explain the construction and working of a pilot operated pressure relief valve with neat sketch. (8)
(ii) Briefly explain the various electrical devices used in the control of fluid power systems. (8)

Or

- (b) (i) Explain with the help of a circuit, how pressure intensification is done in circuit. (8)
(ii) Write short notes on 'sizing of Accumulators'. (8)
14. (a) (i) Explain meter – in and meter – out circuits with neat sketches. (8)
(ii) Draw a neat sketch of reservoir and discuss various roles of reservoir in hydraulic system. (8)

Or

- (b) Develop an electro pneumatic circuit by cascade method for the following sequence: A+B+B-A-C+C- where A, B and C Stands for double acting cylinders. + indicates extension stroke and – indicates retraction stroke of cylinders. (16)

15. (a) (i) Briefly explain the important factors in the maintenance of hydraulic and pneumatic systems. (8)

(ii) List the various approach for entering the program in the PLC. (8)

Or

(b) (i) Draw the pneumatic logic cylinder sequencing circuit with neat Sketch. (10)

(ii) Draw the ladder diagram for dual cylinder sequencing circuit. (6)