Reg. No. : | | | | | | | | | | | |

J 3316

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Sixth Semester

Mechatronics Engineering

ME 1305 — APPLIED HYDRAULICS AND PNEUMATICS

(Regulation 2004)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Specify the importance of fluid power systems.
2. Show the symbol for pump (variable displacement) and pressure reducing valve.
3. Name the three popular construction types of positive displacement pump.
4. What is a telescoping rod cylinder? When would it normally be used?
5. What is check valve? Draw it.
6. Name the three basic types of accumulators.
7. State three types of air compressors.
8. State the usage of muffler.
9. What is servo control system?
10. State the advantages of fluidic elements.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the desirable properties of hydraulic fluids along with different types of fluids used in hydraulic drive.

Or

(b) (i) Explain the advantages of fluid power system and compare hydraulic, pneumatic with electrical systems. (10)

(ii) Discuss the losses in pipes, valves and fittings. (6)

12. (a) How is the pumping action in positive displacement pumps accomplished? Classify any one of it further and explain the working principle.

Or

(b) Classify vane motors and explain the working principle with a neat diagram.

13. (a) Explain the working principle of a sequence valve with a neat sketch. Also draw a hydraulic circuit for sequence operation of cylinders.

Or

(b) Explain the use of accumulator as an emergency power source with a hydraulic circuit.

14. (a) Classify direction control valves used in pneumatic circuits and explain any two in detail.

Or

(b) Design a pneumatic system in which cylinder 'A' is used to clamp the workpiece, cylinder 'B' is used for punching and cylinder 'C' removes the work piece from the station, as per the following sequence of operation. $A^+B^+B^-A^-C^+C^-$.

15. (a) Explain hydraulic-mechanical servo system with suitable example.

Or

(b) Clearly explain the trouble shooting of pneumatic systems.
