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

Question Paper Code : 72133

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Seventh Semester

Mechanical Engineering

ME 6021 — HYDRAULICS AND PNEUMATICS

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write Pascal's Law and state its significance.

2. Distinguish between positive and variable displacement pump.

3. Draw the graphical symbol for : Push button operated, four ways, two position, spring return DCV.

4. Why are double acting cylinders known as differential cylinders?

5. Suggest a speed control circuit for a double acting cylinder, which controls resistive load.

6. Differentiate between single stage and two stage servo valves.

7. What is the purpose of quick exhaust valve?

8. State the Coanda Effect.

9. What are the advantages of clectro-pneumatic control?

10. How is Microprocessor differ from PLC?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the advantages and disadvantages of hydraulic power system? (6)

(ii) What are the functions of a fluid in any fluid power system? (6)

(iii) Discuss laminar how and turbulent flow. (4)

Or

(b) (i) How do you classify pumps? (3)

(ii) Sketch constructional details of axial piston pump, label its components and explain its working. (13)

12. (a) (i) Sketch and explain the construction and working of Telescopic cylinder. (7)

(ii) A hydraulic motor has a 100 cm^3 volumetric displacement. If, it has a pressure rating of 140 bar and receives oil from 0.001 m^3/s theoretical flow rate pump, find the motor, (3 × 3 = 9)

(1) Speed

(2) Theoretical Torque

(3) Theoretical kW Power.

Or

(b) Sketch and explain the construction and working of the following :

(i) 4/3 Directional control valve (5)

(ii) Pressure compensated flow control valve (6)

(iii) Sequence Valve. (5)

13. (a) Draw and explain a hydraulic circuit diagram of a hydraulic system having a double acting cylinder, which has a rapid approach speed, then a slow speed motion and at the end of the stroke the cylinder returns slowly. (16)

Or

(b) Explain with suitable circuits, how an accumulator can be used as,

(i) An emergency power source (8)

(ii) Hydraulic shock absorber. (8)

14. (a) (i) Discuss the construction and working principle of a Rotary Vane air compressor. (8)

(ii) Discuss the function of FRL unit with a neat diagram. (8)

Or

(b) (i) How is AND & OR function is achieved in hydraulic circuit? (8)

(ii) Discuss the circuit for memory function in fluidics. (8)

15. (a) Draw and explain electro-pneumatic reciprocating circuit. (16)

Or

(b) Write notes on the following :

(i) Low cost Automation (8)

(ii) Power Packs (8)
