

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION (Regular), JULY 2022**MACHINE DESIGN****(2021 Scheme)****Course Code: 21MD204-B****Course Name: Oil Hydraulics and Pneumatics****Max. Marks: 60****Duration: 3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. "Fluid power is one of the three major types of power transfer systems commonly used today". Comment on the validity of the statement.
2. With the help of a neat figure, discuss the purpose of using a Vane Motor.
3. Discuss the major intended function of using a directional control valve?
4. Define PCV. Discuss the primary objective of using a PCV?
5. With the help of the graphical representation, discuss the need of using a reservoir in a hydraulic system.
6. Enumerate the major components of a sequencing hydraulic circuits.
7. Write a short note on Compressed air distribution.
8. List three major disadvantages of pneumatic systems.

PART B*(Answer one full question from each module, each question carries 6 marks)***MODULE I**

9. a) List and explain the various industrial applications of fluid power. (3)
b) Discuss six advantages of using fluid power systems. (3)

OR

10. a) Elucidate the major operation principles of fluid power. (3)
b) What are the differences between hydraulic and pneumatic fluid power systems? (3)

MODULE II

11. Explain the following with a neat sketch: (a) Gear Pump, and (b) Lobe Pump (6)

OR

12. Explain the following with a neat sketch: (a) Vane Motor, and (b) Piston Motor (6)

MODULE III

13. A hydraulic cylinder has a rod diameter equal to one half the piston diameter. (6)

Determine the difference in load-carrying capacity between extension and retraction stroke if pressure is constant. Discuss, would happen if the pressure were applied to both sides of the cylinder at the same time?

OR

14. Explicate the importance of improving the performance of a hydraulic cylinder. Also explain the methods used for improving the performance. (6)

MODULE IV

15. Elaborate on the characteristics of the following: - (6)
(a) Cartridge valves, (b) Proportional valves and (c) Servo valves.

OR

16. Explain the following: (a) Counterbalance valve, and (b) Sequence valve (6)

MODULE V

17. With the help of a neat circuit diagram, list the major components and explain the significance of each component in a Synchronizing hydraulic circuit. (6)

OR

18. “Hydraulic symbols are usually used as representations of various components in a hydraulic system”. Why are they used? List the commonly used hydraulic symbols in a fluid powered system. Explain and illustrate them using neat figures. (6)

MODULE VI

19. Define Pneumatics. What are the major advantages and disadvantages of using such a type of system? (6)

OR

20. Define a Hydraulic circuit. Discuss and explain the major design considerations of a hydraulic circuit. (6)
