

# TDM52 fluid power and Thermodynamics

351

REG. NO

OCTOBER 2021

Time: Three hours

Maximum Marks: 75

- Note:
1. Answer ALL the questions in PART-A (1 mark each)
  2. Answer any ONE question from each unit in PART-B (3 marks each)
  3. Answer any ONE question from each unit in PART-C (10 marks each)
  4. The question paper contains TWO Pages

## PART-A (1x10=10)

1. Define capillarity.
2. State pascal's law.
3. Draw the ISO symbol for 5/2 DCV.
4. List the different types of pneumatic cylinders.
5. Name the basic components required in hydraulic system.
6. What is an accumulator?
7. State charle's law.
8. Write the general gas equation.
9. List any two advantages of petrol engine.
10. What are the types of heat exchanger?

## PART-B (3x5=15)

### UNIT-I

11. If the density of a liquid is  $840 \text{ kg/m}^3$ . Find its specific weight and relative density.
12. Define fluid and distinguish between ideal fluid and real fluid.

### UNIT-II

13. Describe a shuttle valve with a neat sketch.
14. State the advantages of pneumatic system.

### UNIT-III

15. Draw the sketch of pressure intensifier.
16. Explain the working of a gas filled bladder type accumulator with a neat sketch.

### UNIT-IV

17. Draw the PV and TS diagram for isothermal process.
18. List out the different thermodynamics process.

### UNIT-V

19. Comparison of four stroke and two stroke engines.
20. Explain the conduction method of heat transfer.

351

PART-C (10x5=50)

UNIT-I

21. Explain the hydraulic jack with a neat sketch.
22. Explain Bourdon's tube pressure gauge with neat sketch.

UNIT-II

23. Explain the sketches the working of (i) Quick Exhaust valve (ii) Needle valve.
24. Draw and explain the circuit diagram for the operation of double acting cylinder with metering out control.

UNIT-III

25. Explain the working of external gear pump with a neat sketch.
26. Explain the hydraulic circuit for the table movement of a shaping machine.

UNIT-IV

27. 5kg of gas occupying  $2\text{m}^3$  has an initial temperature of  $20^\circ\text{C}$ . It is heated to a temperature of  $150^\circ\text{C}$  at constant volume. Find (i) Final pressure (ii) Change in internal energy (iii) Change in entropy. Take  $R = 0.287 \text{ KJ/KgK}$  and  $C_p = 1.005 \text{ KJ/KgK}$ .
28. Derive the expressions for the work done and heat transfer during polytropic process.

UNIT-V

29. Explain the working of four stroke petrol engines.
30.
  - a) Explain the Stefan Boltzmann law of radiation.
  - b) Explain the temperature distribution for a parallel flow heat exchanger.

\*\*\*\*\*