

IV Semester Diploma Examination, May 2012

# MECHANICAL ENGINEERING BOARD

## FLUID POWER ENGINEERING

Time : 3 Hours ]

[ Max. Marks : 50

- Instructions :**
- (1) Section I is compulsory.
  - (2) Answer two full questions from Sections – II, III & IV.
  - (3) Assume missing data, if any

### SECTION – I

- (a) Fill in the blanks :
- (i) In hazardous places \_\_\_\_\_ type of system are used.
  - (ii) Lobe pumps are also called as \_\_\_\_\_ pumps.
  - (iii) A cylinder is a \_\_\_\_\_ actuator.
  - (iv) \_\_\_\_\_ system is a closed loop system.
  - (v) Bi-stable flip flop can be manufactured from \_\_\_\_\_ material.
- (b) Sketch and explain Basic Hydraulic System.

### SECTION – II

- (a) State the aims of automation.
  - (b) Explain the working principle of vane pumps.
  - (c) Write the difference between axial piston pump and In line piston pump.
- (a) Sketch and explain the construction of 4 – way direction control valve.
- (b) State advantages and disadvantages of poppet valve.
- (c) State the function of Control valves.
- (a) Explain unidirectional and Bidirectional hydraulic motor with symbols.
- (b) Explain the operation of radial piston motor.
- (c) Explain the working of Diaphragm Accumulator.



## SECTION - III

5. (a) Draw the circuit for solenoid control of a hydraulic cylinder by using Direction control valve.
- (b) Give the Symbols of the following :
- (1) Check valve
  - (2) Flow meter
  - (3) Heater
  - (4) Pressure Relief valve
  - (5) GAS charged accumulator
- (c) Design meter-out circuit and give its characteristics.
6. (a) Design hydraulic circuit for a robot arm.
- (b) Design accumulator circuit used for emergency source of power.
- (c) What is Pneumatics ? List its applications.
7. (a) Describe the Diaphragm type compressor and state its advantages.
- (b) What is 5/2 DCV ? Explain with neat sketch.
- (c) Explain Radial Piston Motor.

## SECTION - IV

8. (a) Compare hydraulic and pneumatic system.
- (b) Draw the circuit and explain the pilot controlled double acting cylinder valve.
- (c) State the industrial application of semi-automatic material handling circuit.
9. (a) What are the advantages of combination circuits ?
- (b) Explain the mechanical hydraulic servo system with sketch.
- (c) Explain Bi-stable flip-flop with sketch.
10. Write short notes on any **three** of the following :
- (a) FRL unit
  - (b) Causes of contaminations in hydraulic system
  - (c) Application of fluidics
  - (d) Double - Acting cylinder