

## Sample Question Paper:

### Scheme – I

**Programme Name** : Mechanical Engineering  
**Programme Code** : ME  
**Semester** : Sixth  
**Course Title** : Industrial Hydraulics and Pneumatics  
**Marks** :70

**22655**

**Time:3Hrs.**

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#### Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

#### **Q.1) Attempt any FIVE of the following. (10 Marks)**

- a) Compare oil and air as a medium in fluid system
- b) Draw I.S. symbols for i) Bi directional variable discharge pump and ii) Heat Exchanger
- c) State different types of pumps which are available in variable displacement designs
- d) State two applications of double-acting cylinders
- e) State the difference between pressure relief valve and sequence valve
- f) State the use of twin pressure valve and shuttle valve
- g) State the common faults that can be observed in pneumatic circuit

#### **Q.2) Attempt any THREE of the following. (12 Marks)**

- a) List different Safety precautions required for handling Industrial hydraulics and pneumatics systems
- b) Explain the working of vane motor with a neat sketch
- c) Explain two applications of check valve with suitable diagram
- d) Explain with neat sketch working of screw compressor

#### **Q.3) Attempt any THREE of the following. (12 Marks)**

- a) Compare Gear pump and Piston pump (4 imp point)
- b) Explain the need of pressure and temperature compensation in flow control valve
- c) Out of the three speed control methods, select the suitable one for hydraulic shaper and explain it with circuit diagram
- d) A machine holds the steel sheet and then punches a hole. The sheet is released when the punch goes back. Suggest and draw the suitable circuit for this situation

**Q.4) Attempt any Three of the following.**

**(12 Marks)**

- a) Give full classification of control valves used in fluid system
- b) Explain with neat sketch working of Pressure reducing valve
- c) State any four types of accessories used in pneumatic system along with their function
- d) Draw and explain a suitable circuit in which two actuators move forward simultaneously with same speed
- e) Draw and explain the circuit diagram to control speed of the single acting hydraulic cylinder using air-oil reservoir in hydro pneumatic system

**Q.5) Attempt any TWO of the following.**

**(12 Marks)**

- a) One application needs a single acting cylinder capable of giving longer stroke strength. However the space available to fit in that cylinder in retracted condition is comparatively less. Suggest the type of actuator to be used in such condition with justification. Explain its working with sketch.
- b) Discuss the situations in which following types of center positions of DC valves are preferred i) All ports open and ii) Tandem center
- c) It is required to delay the controlling action by sometime after the actuation of DC valve. Select the suitable valve for this application and explain its working with neat sketch

**Q.6) Attempt any TWO of the following.**

**(12 Marks)**

- a) Draw and explain two pump unloading circuit
- b) A hydraulic press machine can be operated from both the sides. Draw a pneumatic circuit which ensures both hands safely of the worker while operating the machine from any side
- c) Design and draw a hydraulic circuit to achieve following objectives i) piston advances with uniform speed in the first half of forward stroke, ii) with reduced speed in the next half of forward stroke and iii) return quickly

**Sample Test Paper I**

**Scheme – I**

**Programme Name : Mechanical Engineering**  
**Programme Code : ME**  
**Semester : Sixth**  
**Course : Industrial Hydraulics and Pneumatics**  
**Marks : 20**

**22655**

**Time: 1 hour**

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**Instructions:** All questions are compulsory

1. Illustrate your answers with neat sketches wherever necessary
2. Figures to the right indicate full marks
3. Assume suitable data if necessary
4. Preferably, write the answers in sequential order

**Q.1 Attempt any FOUR.**

**(8 Marks)**

- a. State two main limitations of hydraulic system
- b. Draw I.S. symbols for following : i) Gas charged accumulator ii) Oscillatory Motor
- c. Differentiate between single acting and double acting cylinder
- d. Classify flow control valves
- e. Define Cracking pressure and Full flow pressure
- f. State methods of actuation of DC valve

**Q.2 Attempt any Three**

**(12 Marks)**

- a. Explain with neat sketch working of Gear Pump
- b. Explain with neat sketch working of tandem cylinder
- c. Explain with neat sketch working of 4/2 spool type DC valve
- d. Explain with neat sketch working of pressure relief valve

## Sample Test Paper II

### Scheme – I

**Programme Name** : Mechanical Engineering  
**Programme Code** : ME  
**Semester** : Sixth  
**Course** : Industrial Hydraulics and Pneumatics  
**Marks** : 20

**22655**

**Time:1 hour**

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**Instructions:** All questions are compulsory

1. Illustrate your answers with neat sketches wherever necessary
2. Figures to the right indicate full marks
3. Assume suitable data if necessary
4. Preferably, write the answers in sequential order

**Q.1 Attempt any FOUR.**

**(8 Marks)**

- a. State the importance of FRL unit in pneumatic system
- b. List various types of accessories used in hydraulic system
- c. Compare meter in and meter out circuit
- d. State the advantages of indirect controlling of actuators
- e. Draw logic OR circuit
- f. State one commonly occurring fault in hydraulic system along with its remedy

**Q.2 Attempt any Three.**

**(12Marks)**

- a. Explain with neat sketch working of quick exhaust valve
- b. Draw and explain bleed off circuit
- c. Draw and explain Regenerative circuit
- d. Draw well labelled circuit for continuous back and forth motion of piston