A

PART A - (10 x 1 = 10 Marks)

1. Which is the measure of the ability of a fluid flow   CO1- R

    (a) Fire point   (b) Pour point   (c) Viscosity   (d) Volatility

2. In flow, the liquid particles may possess   CO1- R

    (a) potential energy   (b) kinetic energy   (c) pressure energy   (d) all the above

3. Tandem cylinders can be used in   CO2- R

    (a) Synchronizing circuits.   (b) Mid stroke stop circuits

    (c) two speed circuits   (d) all of the above

4. Maximum swash plate angle for axial piston pump is   CO2- R

    (a) 0°   (b) 15°1   (c) 17.5°   (d) 22.5°

5. Shuttle valves allow flow in.   CO3- R

    (a) one direction only   (b) both directions

    (c) either direction after reaching set (d) none of these
    pressure

6. Gas loaded accumulators woks on the basis of the   CO3- R

    (a) Pascal law   (b) Boyle's law   (c) Both A & B   (d) None of these

7. P V = Constant   CO4- R

    (a) Boyle's law   (b) Charle's law   (c) Gay-Lussac's law   (d) General gas law

8. Quick exhaust valves allow   CO4- R

(a) air to exit the cylinder rapidly   (b) oil to exit the cylinder rapidly

(c) both of the above   (d) none of these

9. In an automatic control system which of the following elements is not   CO5- R
   used?

(a) Error detector   (b) Final control element   (c) Sensor   (d) Oscillator

10 ……….. Devices are miniature valve type devices that perform switching   CO5- R
   operations in fluid logic

(a) MPL   (b) PLC   (c) Fluidic   (d) All of the above

PART – B (5 x 2= 10 Marks)

11 Define the term "Fluid Power".   CO1- U

12 Explain the Pumping theory   CO2- U

13 List out the types of valve actuation methods.   CO3- U

14 Explain the function of air filter and dryer   CO4- U

15 State any four common causes for hydraulic system   CO5- U
   breakdowns.

PART – C (5 x 16= 80 Marks)

16 (a) Explain the working principle of Hydraulic Power System. Also   CO1-U   (16)
       draw the symbols of Hydraulic Fixed displacement, unidirectional
       pump.

Or

(b) Hydraulic pump delivers oil at 60 bar, 120 l/min into a circuit laid   CO1-Ana   (16)
    on a horizontal plane. There are 4 elbow (K=0.75), one globe
    valve fully open (K=10) and a direction control valve (pressure
    drop = 3 bar) with the inside diameter of pipe as 30 mm. The total
    length of the straight run pipe is 20 m and the specific gravity of
    the oil is 0.9.The kinematic viscosity of the oil is 0.0001 m^2/s.
    Find the pressure in bar at the exit point of the pipe.

17 (a) Explain the construction and working principle of External Gear   CO2-U   (16)
       pump with neat Sketch

Or

(b) Explain the construction and working principles of double acting   CO2-U   (16)
    cylinder and cylinder cushioning with neat sketch.

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18 (a) Explain the construction and working principle of 4/3 DCV and   CO3-U   (16)
       Centre flow configuration for 4/3 DCV with neat sketch.

                                    Or

   (b) Explain any two application circuits employing accumulator for   CO3-U   (16)
       different purposes with neat sketch.

19 (a) Explain the construction and working principle of a screw   CO4-U   (16)
.   compressor with neat sketch

                                    Or

   (b) Design an electro pneumatic circuit using cascade method for the   CO4-Ana   (16)
       following sequence A+ B+ B- A- C+ C-

20 (a) Explain the Hydro mechanical servo valve with an industrial   CO5-U   (16)
.   example.

                                    Or

   (b) Explain the various types of pneumatic switching elements with   CO5-U   (16)
       simple sketch