

22345

**21819**

**3 Hours / 70 Marks**

Seat No.

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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) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :**

**5 × 2 = 10**

- (a) Define Kinematic Viscosity.
- (b) State Capillary effect.
- (c) State Bernoulli's theorem.
- (d) Write any four applications of oil hydraulic system.
- (e) Draw layout of hydraulic system and label it.
- (f) Classify Pumps.
- (g) Define Priming of centrifugal pumps.

**2. Attempt any THREE of the following :**

**3 × 4 = 12**

- (a) Describe the concept of Atmospheric, Gauge & Vacuum pressure.
- (b) Derive an equation of actual discharge through venturimeter.
- (c) Describe essential properties of oils used in hydraulic system. (Eight Points)
- (d) Explain construction & working principle of Rotary Spool type DC valve with sketch.

3. Attempt any **THREE** of the following :

**3 × 4 = 12**

- (a) Explain inverted U-tube manometer with neat sketch.
- (b) Derive equation of actual velocity of fluid flow for Pitot tube.
- (c) Differentiate between meter-in and meter-out oil hydraulic system. (any four)
- (d) Describe the purpose of hydraulic oil seal. Explain any one type of oil seal.

4. Attempt any **THREE** of the following :

**3 × 4 = 12**

- (a) Compare Laminar & Turbulent flow. (any four)
- (b) Give classification of filters used in hydraulic system. Explain any one of them.
- (c) Describe construction & working of pressure reducing valve with line sketch.
- (d) Define following w.r. to centrifugal pump :
  - (i) Static head
  - (ii) Manometric head
  - (iii) Mechanical efficiency
  - (iv) Manometric efficiency
- (e) Draw symbols of
  - (i) 2 × 2 DCV
  - (ii) Fixed type FCV
  - (iii) Pressure Relief Valve
  - (iv) Muffler

5. Attempt any TWO of the following :

2 × 6 = 12

- (a) An isosceles triangular plate base 1.4 m & height 2.3 m is immersed in water vertically in such a way that apex is in downward direction & side of base is parallel & 40 cm below free water surface level. Determine total pressure & centre of pressure.
- (b) State merits & demerits of oil hydraulic system. (two each)
- (c) Explain time delay valve with neat sketch.

6. Attempt any TWO of the following :

2 × 6 = 12

- (a) State Darcy's formula for loss of head. Name the variables.
  - (b) Draw and explain working of motion synchronization circuit.
  - (c) Sketch and explain working of Quick exhaust valve used in pneumatics system.
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