15162

3 Hours / 100 Marks   Seat No.

Marks

1. A) Attempt **any three** of the following :   **12**

a) State and explain Pascal's law.

b) Give two types of hydraulic actuators and write one application of each.

c) Write purpose of :

   i) Rotary spool valve

   ii) Non-return valve

   iii) Air motor

   iv) Hydraulic cylinder

d) Write difference between filters and strainers (4 points).

B) Attempt **any one** of the following :   **6**

a) State Bernoulli's theorem. Write meaning of each term. Give its two applications.

b) Describe with neat sketch construction and working of gear type Air motor.

2. Attempt **any four** of the following :   **16**

a) Give classification of fluids and write one example of each.

b) Write causes and remedies for a symptom-"Low discharge through centrifugal pump".

c) What is meant by 'slip' in reciprocating pump ? State significance of negative slip.

d) Describe the working principle of hydraulic press.

e) Compare gear pump with vane pump on the basis of –

   i) Discharge pressure

   ii) Speed

   iii) Overall efficiency

   iv) Application

Marks

3. Attempt **any four** of the following :   **16**

   a) Draw a schematic diagram of hydraulic Jack and label the components.

   b) Draw a neat labelled sketch of rotary spool type DC valve.

   c) What is Air motor ? Give its two applications.

   d) State two functions of seals and gaskets. Give two applications in hydraulic circuits.

   e) Draw full-flow filter and describe its working.

   f) Define –
     i) Atmospheric pressure
     ii) Gauge pressure
     iii) Vacuum pressure
     iv) Absolute pressure

4. A) Attempt **any three** of the following :   **12**

   a) Draw a neat sketch of swash plate type gear pump and lebel it.

   b) Describe construction and working of pressure relief valve.

   c) What is 'FRL' unit ? Describe the function of each component.

   d) Draw symbols for –
     i) Filter
     ii) Unidirectional variable displacement hydraulic pump
     iii) 3×2 DC valve
     iv) Bi-directional Air motor.

  B) Attempt **any one** of the following :   **6**

   a) Draw meter-in circuit and state its two applications.

   b) Explain air brake with heat labelled sketch.

5. Attempt **any two** of the following :   **16**

   a) Derive an expression for discharge through orifice meter by applying Bernoulli's theorem.

   b) Describe with neat sketch construction and working of double acting reciprocating pump.

   c) Draw circuit diagram for hydraulic power steering and describe its working.

6. Attempt **any two** of the following :   **16**

   a) State four pressure measuring gauges. Describe construction and working of Bourdon tube pressure gauge and give its two applications.

   b) i) Why priming is necessary in centrifugal pump ? What are methods of priming ?

     ii) What factors are to be considered while selection of pump ?

   c) Compare hydraulic and pneumatic circuits.

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