**17522**

**21415**

3 Hours/100 Marks

Seat No. | | | | | | | | |

***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.*

**MARKS**

1. A) Attempt **any three** of the following : **12**
   a) Define viscosity and specific gravity alongwith their unit.
   b) State two locations each, where seals and gaskets are used in hydraulic system.
   c) Give classification of hydraulic actuator.
   d) Write the function of flexible hose, filters, lubricators and gaskets.

1. B) Attempt **any one** of the following : **6**
   a) Describe meaning and relation between atmospheric gauge and vacuum pressure.
   b) Write construction and working of non-return valve with neat sketch.

2. Attempt **any four** of the following : **16**
   a) Define Beurnaulli's theorem and give its applications.
   b) The two faults in centrifugal pumps are; fails to start pumping and low efficiency; write two causes and two remedies of each.
   c) How priming in centrifugal pump is done ? Why it is done ?
   d) Compare the characteristics of vane and swash plate type pump and give one application for each pump.
   e) Explain construction and working of Hydraulic Ram.

3. Attempt **any four** of the following : **16**
   a) Draw the labelled sketch of swash plate pump.
   b) Explain construction and working of $^{4}/_{2}$ DC valve which is used in hydraulic systems.
   c) Give classification of valves.
   d) Explain full flow hydraulic filter with neat sketch.
   e) Explain working of the FRC unit with neat sketch.

**P.T.O.**

**MARKS**

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

   a) What is the Pascal's law ? State its applications.

   b) Explain construction and working of piston type air motor.

   c) Draw neat sketch of proportional type of filter and write its construction and working with principle.

   d) Draw general layout of pneumatic system and label the components.

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

   a) Draw layout of hydraulic steering system. Explain its working.

   b) Compare hydraulic and pneumatic circuit on the basis of - fluid used, ease of operation, noise, speed, cost, application.

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

   a) Derive on expression of discharge through orifice meter.

   b) What is negative slip in reciprocating pump and why air vessel is used in the pump ?

   c) Draw meter-in circuit and explain its working.

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

   a) A oil of specific gravity 0.8 is flowing through horizontal venturimeter having inlet diameter 30 cm and throat diameter is 15 cm. The differential manometer shows reading of 30 cm of mercury. Calculate discharge of oil through venturimeter if $C_d = 0.98$.

   b) Explain construction and working of centrifugal pump with neat sketch. Give its two applications.

   c) Draw the neat labeled layout of hydraulic braking system and explain its working.

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