



12170

13141

3 Hours/100 Marks

Seat No.

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- Instructions :**
- (1) **All** questions are **compulsory**.
 - (2) Answer **each** next main question on a **new** page.
 - (3) Illustrate your answers with neat sketches **wherever** necessary.
 - (4) Figures to the **right** indicate **full** marks.
 - (5) Assume suitable data, if **necessary**.
 - (6) Use of Non-programmable Electronic Pocket Calculator is **permissible**.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are **not** permissible in Examination Hall.
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MARKS

1. A) Attempt **any three** of the following : **12**
- 1) Define following terms and state their S.I. unit.
 - a) Dynamic viscosity
 - b) Surface tension
 - 2) State Bernoullie's theorem and list any two assumptions made while deriving it.
 - 3) Explain how Pascal's law is utilised in Hydraulic ram.
 - 4) Draw the symbols for following :
 - a) Hydraulic pump
 - b) $3/2$ DC valve
 - c) Filter
 - d) Double acting cylinder

P.T.O.



MARKS
6

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

- 1) Define atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure. Represent these pressure on schematic diagram.
- 2) Draw a neat sketch of venturimeter. Explain why divergent section has more length than convergent section.

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

16

- 1) Give the different types of manometers used for pressure measurement. State the limitations of Piezometer tube.
- 2) List out different types of fluid flows. Define steady and unsteady flow.
- 3) Differentiate between centrifugal pump and reciprocating pump.
- 4) Explain with neat sketch vane type air motor.
- 5) Give the different functions of hydraulic seals.
- 6) Explain construction of ball valve with neat sketch.

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

16

- 1) Explain Bourdon tube pressure gauge with labeled diagram.
- 2) Define various hydraulic coefficients and give the relation between them if any.
- 3) What is priming and why it is necessary in centrifugal pump ?
- 4) Draw a neat sketch of non return valve and explain it.
- 5) Explain with neat sketch bleed off circuit.



MARKS
12

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

- 1) State the law of continuity. Water flows through a pipe of diameter 1.6 m with a velocity of 3 m/s. Find the rate of discharge through pipe.
- 2) Define :
 - a) Mechanical efficiency
 - b) Hydraulic efficiency of a centrifugal pump.
- 3) State the function and advantages of air vessel in reciprocating pump.
- 4) Explain rotary spool valve with neat sketch.

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

6

- I) A venturimeter with 200 mm at inlet and 100 mm throat is laid horizontally and used for measuring the flow of oil of specific gravity 0.8. U-tube differential manometer gives deflection of 180 mm. The discharge through venturimeter is found to be 60 litres per second. Find out coefficient of discharge for this meter. Take specific gravity of mercury = 13.6.
- II) Draw neat sketch of arrangement of reciprocating pump. Label all the parts. Explain construction and working of reciprocating pump.

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

16

- 1) Give the classification of air compressors. Differentiate between reciprocating and rotary compressor.
- 2) Explain sequencing pneumatic circuit with neat sketch.
- 3) a) Explain with neat sketch gear type hydraulic motor.
b) Draw general layout of pneumatic circuit and label all the parts.

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

16

- 1) Give the applications of hydraulics and pneumatics in automobiles. Explain any one of them with neat sketch.
- 2) a) Explain flexible hose. State material used for it.
b) What are different types of filters ? State its functions.



- 3) a) Identify the following circuit in Figure No. 1.
b) Make correction if any (Redraw).
c) Label it and explain its working.
d) State its applications.

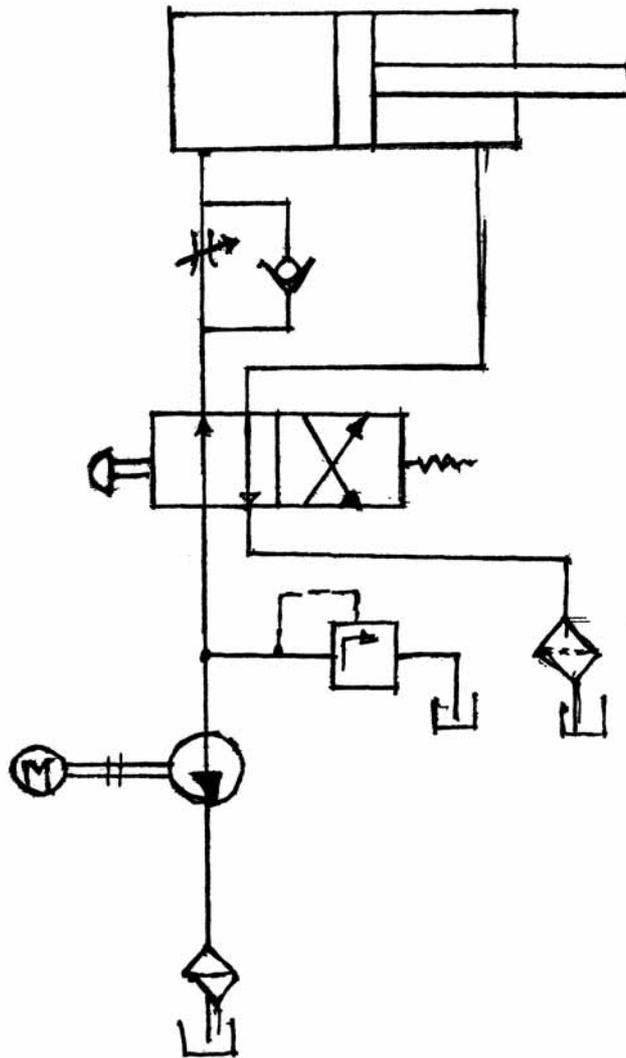


Fig. No. 1 Q. 6 (3)
