

THIRD SEMESTER DIPLOMA EXAMINATION IN ENGINEERING / TECHNOLOGY  
MARCH 2014

FLUID MECHANICS AND PNEUMATICS  
(Common for ME and TD)

Maximum Marks : 100

Time : 3 Hrs

PART - A

(Maximum marks: 10)

- I. Answer all questions in one or two sentences. Each question carries two marks
- |   |           |
|---|-----------|
|   | Marks     |
| 1 Define specific weight and specific gravity |           |
| 2 What is meant by intensity of pressure?     |           |
| 3 What is fluid power?                        |           |
| 4 What is hydraulic intensifier?              |           |
| 5 What is the use of pitot tube?              | [5x2 =10] |

PART - B

(maximum marks : 30)

- II Answer any five questions. Each question carries 6 marks
- |  |          |
|--|----------|
| 1 What is a manometer? Describe a differential manometer.                            |          |
| 2 Draw the sketch of a Bourden tube pressure gauge and describe its working.         |          |
| 3 State Bernoulli's theorem. What are the assumptions made in Bernoulli's equation?  |          |
| 4 What is a notch? Explain the difference between orifice and notch                  |          |
| 5 Explain hydraulic gradient line and total energy line with a suitable sketch.      |          |
| 6 Draw a line diagram of a hydraulic system and explain the function of each element |          |
| 7 Write short notes on accumulators  | [5x6=30] |

PART - C

(maximum marks : 60)

(Answer one full question from each unit. Each full question carries 15 marks)

UNIT I

- III a Explain briefly (i)Viscosity (ii)Surface tension (iii) capillarity (iv) oxidation stability [8]  
b An open tank contain water up to a depth of 4m and above it an oil of specific gravity 0.85 for depth of 3m. Find the pressure intensity (1) at the interface of two liquid (2) at the bottom of tank [7]

OR

- IV a With the help of a diagram explain the difference between atmospheric pressure, Absolute pressure, Gauge pressure and vacuum pressure [8]  
b Determine the total pressure on an isosceles triangular plate of the base 4m and altitude 4m when it is immersed vertically in an oil of specific gravity 0.8. The base of the plate coincides with the free surface of oil. [7]

UNIT II

- V a Explain briefly (i) steady and unsteady flow (ii) Laminar and turbulent flow (iii) uniform flow [8]  
b A pipe diameter 200mm conveys 2500 litres of water per minute and has a pressure of 20kN/m<sup>2</sup> at a certain section. If the datum head is 5m, find the total energy head at the section [7]

OR

- VI a What are the limitations of Bernoulli's theorem? [8]  
b A venturi meter is placed in horizontal pipe of 50mm diameter through which water is flowing. The diameter of throat is 20mm. determine the discharge through the pipe in litres per minute, when the venturi head is 420mm of water. Assume the Coefficient of discharge of the meter is 0.97. [7]

UNIT III

- VII a What are the properties of hydraulic fluid? [8]  
b Describe an automatic cylinder reciprocating circuit with line diagram [7]

OR

- VIII a What are the functions of a control valve? With a line diagram describe a 4/3 DCV. [8]  
b Sketch and explain an intensifier. [7]

UNIT IV

- IX a What are the advantages of pneumatic circuit over hydraulic circuit? [8]  
b With a sketch explain an air lubricator [7]

OR

- X a Draw the diagram of pneumatic system and explain the function of each element [8]  
b What is an air motor? Write the advantages of air motor [7]

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