



PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 30

Max Time: 55 Mins

Weightage: 15 %

Set A

TEST-3 EXAMINATION

II Semester 2016-2017

Course: PE A 202 Fluid Mechanics

17 April 2017

Instructions:

- i. Write legibly
- ii. Draw the figures legibly and give proper notations
- iii. Scientific and non programmable calculators are permitted

Part A

(4 Q x 2 M= 8 Marks)

1. What is flow line and stream line?
2. Define the following:
(a) Model (b) Prototype
3. List out minimum 4 advantages of dimensional analysis.
4. Differentiate between axial flow pump and mixed flow pump.

Part B

(2 Q x 6 M= 12 Marks)

5. Water is flowing through a pipe having diameters 400mm and 200mm at the cross section 1 and 2 respectively. The velocity at section 1 is 5 m/s. Find the velocity at section 2 and rate of discharge.
6. Explain the main parts of centrifugal pump with the help of neat sketch.

Part C

(1 Q x 10 M= 10 Marks)

7. The power input P to a centrifugal pump is a function of the volume flow rate (Q), impeller diameter (D), rotational rate (Ω), and the density (ρ) and viscosity (μ) of the fluid:
Using Buckingham's Π -method, find the dimensionless equation
Hint: Use Ω , ρ , D as repeating variables.



**PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING**

Max Marks: 30

Max Time: 55 Mins

Weightage: 15 %

Set A

TEST-2 EXAMINATION

II Semester 2016-2017

Course: PE A 202 Fluid Mechanics

20 March 2017

Instructions:

- i. Write legibly
- ii. Draw the figures legibly and give proper notations
- iii. Scientific and non programmable calculators are permitted

Part A

Answer the following questions

(2 Q x 4 M= 8 Marks)

1. (a) Define Pascal's law.
(b) A manometer is used to measure the pressure of a gas in a tank. Determine the absolute pressure within the tank if the local atmospheric pressure is 94 kpa. The fluid flowing in the manometer column is having a specific gravity of 0.7 and the height of the column is 63 cm.
2. List out the various classification of motion of fluid particles with neat sketch.

Part B

Answer the following questions

(2 Q x 6 M= 12 Marks)

3. Derive a continuity equation in integral form of control volume.
4. A rectangular plate of length 7 m and breadth of 4 m is immersed vertically in an oil of specific gravity 0.6. The base of the plate coincides with the free surface of oil, Calculate
 - (a) Total pressure force on the plate
 - (b) Centre of pressure

Part C

Answer the following questions

(1 Q x 10 M= 10 Marks)

5. Derive a Navier-Stokes equation for conservation of momentum with the help of neat sketch.



PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 30

Max Time: 55 Mins

Weightage: 15 %

Set A

TEST-1

II Semester 2016-2017

Course: PE A 202 Fluid Mechanics

20 February 2017

Instructions:

- i. Write legibly
- ii. Draw the figures legibly and give proper notations
- iii. Scientific and non programmable calculators are permitted

Part A

(4 Q x 3 M= 12 Marks)

1. Define the following:
a) Fluid dynamics (b) Viscosity (c) Surface Tension
2. List out basic laws which are applicable to any kind of fluid. Explain any two of them.
3. Draw a neat graph between shear stress and velocity gradient.
4. Determine the dynamic viscosity of a liquid in poise having kinematic viscosity 9 strokes and specific gravity of 2.5?

Part B

(2 Q x 4 M= 8 Marks)

5. A body has a mass of 25slugs when it is exposed to a standard Jupiter gravity of 24.79m/s^2 .
a) Calculate the weight of the body in kg?
b) Find out the weight of the same body in kg if it is placed in mars having a standard gravity of 3.711m/s^2 ?
6. Derive an equation of pressure gradient in incompressible liquids.

Part C

(1 Q x 10 M= 10 Marks)

7. Draw a flow chart on various classifications of fluid motions and explain briefly.