ID NO.	

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 40 % Max Marks: 40 Max Time: 02 hrs. 10 May 2018 Thursday

ENDTERM FINAL EXAMINATION MAY 2018

Even Semester 2017-18 Course: **PET 205 Momentum Transfer** IV Sem. Petroleum

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Instructions:

(i) Read the question properly and answer accordingly.

(ii) Scientific and Non-programmable calculators are permitted

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Part A

(2 Q x 6 M = 12 Marks)

1. Define the following:

   (a) Drag (b) Wall Drag (c) Creeping flow

   (d) Stagnation pressure (e) Free settling (f) Particulate fluidization

2. A pitot-static tube placed in the centre of a 500 mm pipe line has one orifice pointing upstream and other perpendicular to it. The mean velocity in the pipe is 0.50 of the central velocity. Find the discharge through the pipe if the pressure difference between the two orifices is 50 mm of water. Take the coefficient of pitot tube as C_v= 0.98

Part B

(3 Q = 16 Marks)

3. What are the disadvantages of fluidization: (4M)
4. Explain the forces act on particles moving through a fluid: (4M)
5. A horizontal venturimeter with inlet diameter 25 cm and throat diameter 12 cm is used to measure the flow of oil of sp. gr. 0.75. The discharge of oil through it is 45 litres/s. Find the reading of the oil-mercury differential manometer. Take C_d= 0.98 (8M)

Part C

(1 Q x 12 M = 12 Marks)

6. A centrifugal pump discharges 0.15 m3/s of water against a head of 12.5 m, the speed of the impeller being 600 r.p.m. The outer and inner diameters of impeller are 500 mm and 250 mm respectively and the vanes are bent back at 35o to the tangent at exit. If the area of flow remains 0.07 m2 from inlet to outlet, calculate:
   I. Manometric efficiency of pump
   II. Vane angle at inlet
   III. Loss of head at inlet to impeller when the discharge is reduced by 40% without changing the speed.

ID NO:	

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20% Max Marks: 20 Max Time: 1 hr. 28 March Wednesday 2018

TEST – 2 **SET A**

Even Semester 2017-18 Course: **PET 205 Momentum Transfer** IV Sem. Petroleum

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Instruction:

(i) Read the question properly and answer accordingly.
(ii) Scientific and Non-programmable calculators are permitted
(iii) Draw all figures with pencil only

Part A

(1 Q x 4 M = 04 Marks)

1. Define and explain the following terms with proper equations:
   (a) Navier-Stokes equations
   (b) Euler's equation

Part B

(1 Q x 6 M = 06 Marks)

2. Differentiate laminar flow with turbulent flow in pipes and channels for incompressible fluids using
   (a) Ratio of average velocity to maximum velocity
   (b) Kinetic energy factor
   (c) Momentum correction factor

Part C

(1 Q x 10 M = 10 Marks)

3. Define compressible fluid and explain the process of compressible flow in brief using proper figures for the following:
   (a) Isentropic expansion
   (b) Adiabatic friction flow
   (c) Isothermal friction flow

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PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20 % Max Marks: 20 Max Time: 1 hr. 20 Feb Tuesday 2018

TEST – 1

Even Semester 2017-18 Course: **PET 205 MOMENTUM TRANSFER** IV Sem. Petroleum

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Instruction:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted

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Part A

(1 Q x 4 M = 04 Marks)

1. Define the following:
   (a) Fluid (b) Pressure (c) External flow (d) Compressible Fluid

Part B

(2 Q x 3 M = 06 Marks)

2. Draw a relationship between Shear stress and Velocity gradient for Newtonian and non-Newtonian fluids and explain in brief.
3. Determine the viscosity of a liquid in poise having kinematic viscosity 6 stokes and specific gravity 2.0.

Part C

(1 Q x 10 M = 10 Marks)

4. The resisting force ***R*** of a supersonic plane during flight can be considered as dependent upon the length of the aircraft ***l***, velocity ***V***, air viscosity ***μ***, air density ***ρ*** and bulk modules of air ***K***. Express the functional relationship between these variables and the resisting force.