Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2018

CE2CO04 / ME2CO09 Fluid Mechanics

Programme: Diploma Branch/Specialisation: CE / ME

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Which of the following is the unit of Kinematic viscosity? **1**

(a) Pascal (b) Poise (c) Stokes (d) None of these

ii. A fluid is said to be ideal, if it is: **1**

(a) Incompressible (b) Inviscous

(c) Viscous & incompressible (d) Inviscous & Incompressible.

iii. The bulk modulus of elasticity with increase in pressure. **1**

(a) Increases (b) Decreases

(c) Remains constant (d) Unpredictable

iv. Liquid transmit pressure equally in all the direction. This is according to: **1**

(a) Boyle's Law (b) Archimedes principle

(c) Pascal's Law (d) None of these.

v. Piezometer is used to measure : **1**

(a) Pressure in pipes (b) Atmospheric pressure

(c) Very low pressure (d) Very high pressure

vi. Which of the following instrument is used to measure flow on the application of Bernoulli's theorem? **1**

(a) Venturimeter (b) Orifice meter

(c) Pitot tube (d) All of these

vii. Francis turbine falls under the category of : **1**

(a) Impulse turbine (b) Reaction turbine

(c) Axial flow turbine (d) Mixed flow turbine

P.T.O.

	viii.	Which of the following is high speed turbine : (a) Francis turbine (b) Impulse turbine (c) Propeller turbine (d) None of these	**1**
	ix.	In a centrifugal pump, the liquid enters the pump: (a) At the top (b) At the bottom (c) At the centre (d) From sides	**1**
	x.	One horse power is equal to : (a) 102 watts (b) 75 watts (c) 550 watts (d) 735 watts	**1**
Q.2	i.	Define specific volume and specific gravity,	**2**
	ii.	Define Dynamic and Kinematic Viscosity. Give their Units.	**3**
	iii.	A plate at 0.02mm distance from a fixed plate, moves at 60 cm/s and requires a force of 3 N/m^2 to maintain this speed. Determine the fluid viscosity between the plates.	**5**
OR	iv.	Explain various types of fluid flow.	**5**
Q.3	i.	What do you mean by Vacuum pressure, Gauge pressure and Absolute pressure?	**3**
	ii.	What is the difference between simple manometers and differential manometers?	**7**
OR	iii.	A simple U-tube manometer is used to measure water pressure in pipe line. The left limb of manometer is connected to the pipe and the right limb is open to atmosphere. The mercury level in the left limb is 80mm below the centre of the pipe and the level in the right limb is 200mm above the centre of the pipe. Calculate the pressure of water in meter.	**7**
Q.4	i.	Write any four limitations of Bernoulli's equation?	**2**
	ii.	With the help of neat sketch explain what is Venturimeter? Derive the expression for the discharge through a Venturimeter.	**8**
OR	iii.	What is Pitot tube? Draw its sketch. How will you determine the velocity at any point with the help of Pitot tube?	**8**
Q.5	i.	How will you classify the turbines?	**4**

	ii.	Draw the neat sketch of Pelton turbine and Francis turbine.	**6**
OR	iii.	What is the basis of selection of a turbine at a particular place?	**6**
Q.6		Attempt any two:	
	i.	Explain the working of single stage centrifugal pump with sketch.	**5**
	ii.	What is priming of pump? Why is it necessary?	**5**
	iii.	Explain giving neat sketch working of reciprocating pump.	**5**

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Marking Scheme
CE2CO04 Fluid Mechanics

Q.1 i. Which of the following is the unit of Kinematic viscosity? **1**
(c) Stokes

ii. A fluid is said to be ideal, if it is: **1**
(d) Inviscous & incompressible.

iii. The bulk modulus of elasticity with increase in pressure. **1**
(a) Increases

iv. Liquid transmit pressure equally in all the direction. This is according to: **1**
(c) Pascal's Law

v. Piezometer is used to measure : **1**
(c) Very low pressure

vi. Which of the following instrument is used to measure flow on the application of Bernoulli's theorem? **1**
(d) All of these

vii. Francis turbine falls under the category of : **1**
(b) Reaction turbine

viii. Which of the following is high speed turbine : **1**
(c) Propeller turbine

ix. In a centrifugal pump, the liquid enters the pump: **1**
(c) At the centre

x. One horse power is equal to : **1**
(d) 735 watts

Q.2 i. Define specific volume and specific gravity, **2**
1 mark for each definition (1 mark * 2)

ii. Define Dynamic and Kinematic Viscosity. Give their Units. **3**
1 mark for each definition (1 mark * 2) 2 marks
0.5 mark for each unit (0.5 mark * 2) 1 mark

iii. A plate at 0.02mm distance from a fixed plate, moves at 60 cm/s and requires a force of 3 N/m^2 to maintain this speed. Determine the fluid viscosity between the plates. **5**
Writing correct given data 1 mark
Formula 1 mark
Correct answer 2 marks
Correct unit. 1 mark

OR iv. Explain various types of fluid flow **5**
1 mark for each type of flow (1 mark * 5)

Q.3 i. Vacuum pressure, Gauge pressure and Absolute pressure. **3**
1 mark for each definition (1 mark * 3)

ii. What is the difference between simple manometers and differential manometers? **7**
Any 4 differences

OR iii. A simple U-tube manometer is used to measure water pressure in pipe line. The left limb of manometer is connected to the pipe and the right limb is open to atmosphere. The mercury level in the left limb is 80mm below the centre of the pipe and the level in the right limb is 200mm above the centre of the pipe. Calculate the pressure of water in meter. **7**
Diagram 1 mark
Writing correct given data 2 marks
Writing correct formula 2 marks
Correct answer 2 marks

Q.4 i. Write any four limitations of Bernoulli's equation? **2**
0.5 marks for each limitation (0.5 mark * 4)

ii. What is Venturimeter? Derive the expression for the discharge through a Venturimeter.. **8**
Definition 2 marks
Diagram 2 marks
Derivation 4 marks

OR iii. What is Pitot tube? Draw its sketch. How will you determine the velocity at any point with the help of pitot tube. **8**
Definition 2 marks
Diagram 2 marks
Velocity determination 4 marks

Q.5 i. How will you classify the turbines ? **4**
Any 4 classification for 1 mark each (1 mark * 4)

ii. Draw the neat sketch of Pelton turbine and Francis turbine. **6**
3 marks for each diagram (3 marks * 2)

OR iii. What is the basis of selection of a turbine at a particular place? **6**
1 mark for each point, total 6 points (1 mark * 6)

Q.6 Attempt any two:

i. Explain the working of single stage centrifugal pump with sketch. **5**

Diagram 2 marks

Explanation 3 marks

ii. What is priming of pump? Why is it necessary? **5**

Priming of pump 3 marks

Its necessity 2 marks

iii. Explain with the help of neat sketch working of reciprocating pump. **5**

Diagram 2 marks

Explanation 3 marks

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