



BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – Dip.ME-2019/Dip.ME-2021
Course Name – Fluid Mechanics & Machinery
Course Code - DME405
(Semester IV)

LIBRARY Brainware University Barasat, Kolkata -700125

Full Marks: 60

Time: 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

- 1. Choose the correct alternative from the following:
- (i) Idicate the transport quantity for which a Centrifugal pump is required.
 - a) pressure.

b) speed.

c) power.

- d) fluid.
- (ii) Bernoulli's equation relates
 - a) various forms of mechanical energy
- b) various forces involved in fluid flow
- c) torque to change in angular momentum
- d) various forces with change in momentum
- (iii) The centrifugal pump is started with its delivery valve____
 - a) kept fully closed.

- b) kept fully open.
- c) kept irrespective of any position.
- d) kept 50% open.
- (iv) A Venturimeter is a device used to determine
 - a) pressure in a fluid

b) velocity at a point

c) flow rate

- d) temperature of the fluid
- (v) Quote the unit of specific gravity of liquid.
 - a) The same unit as that of mass density.
- b) The same unit as that of weight density.
- c) The same unit as that of specific volume.
- d) Unitless.
- (vi) Identify the specific gravity of oil whose specific weight is 7.85 kN/m³.
 - a) 0.8.

b) 1.

c) 1.2

- d) 1.6.
- (vii) Mercury does not wet the glass. Identify the property of the liquid.
 - a) Cohesion.

b) Adhesion.

c) Viscosity.

- d) Surface tension.
- (viii) Identify the phenomena due to which the falling drops of water become sphere.
 - a) Surface tension of water.

b) Compressibility of water.

c) Capillarity of water.

- d) Viscosity of water.
- (ix) Identify the method which exclusively used in fluid mechanics.
 - a) Lagrangian method.

- b) Eulerian method.
- c) Both Lagrangian and Eulerian methods.
- d) Neither Lagrangian nor Eulerian method.

	(x)	Identify the nature of a Reciprocating pump.				
	(a) Negative displacement pump. c) Diaphragm pump. Establish the appropriate relation related to the	d)	Positive displacement pump. Emulsion pump.		
			Establish the appropriate relation related to the which is				
			a) directly proportional to the area of the vessel containing liquid. b) directly proportional to the area of the vessel containing liquid.		directly proportional to the depth of li from the surface.		
	Prainware University 00152 A. Kulkela - 70-125		 c) directly proportional to the length of the vessel containing liquid. Compute the pressure at a point 4 m below th 		inversely proportional to the depth of liquid from the surface.		
;	. 52						
1	EE.		a) 19.24 kPa. c) 39.24 kPa.		29.24 kPa. 49.24 kPa.		
	8 2 3		Indicate the pressure which is measured with r				
	3 9 2tion		a) Atmospheric pressure.				
	E T WELDE		s) Absolute pressure.		Gauge pressure. Mean pressure.		
	£ ; ()	xiv)	Interpret the formula of absolute pressure.	u,	Weari pressure.		
	3		a) Gauge pressure+ atmospheric pressure.	h)	Gauge pressure - atmospheric pressure	•	
			c) Atmospheric pressure - gauge pressure.		Gauge pressure - vacuum pressure.	e.	
	(xv)	Reciprocating pumps are also identified as				
			a) force pumps.	b)	mass pumps.		
			c) heat pumps.		speed pumps.		
			Group-B				
		(Short Answer Type Questions) 3 x !					
	2	2. Establish the terminology potential head, velocity head and datum head from Bernoulli's (Theory.					
	3	R Distinguish between: uniform flow and non-uniform flow					
	4. Distinguish between: incompressible and compressible flow.5. State and explain the Pascal's law of hydrostatics.					(3)	
						(3) (3)	
	6	. Cr	Criticize the phenomena, 'Priming is essential for centrifugal pump'.				
		OR '				(3)	
		hy	stinguish between hydraulic efficiency, mechan draulic turbine.	ical	efficiency and overall efficiency for a	(3)	
		Group-C					
			(Long Answer Type Questions) 5 :				
	7	2	A differential U-tube mercury manometer is used between points 1 and 2 in a pipeline conveying way. The difference in level of manometric fluid on the state of t	ater.	The point 1 is 0.5 m lower than point	(5)	
		C	difference between point 1 and 2. Assume density of mercury as 13600 kg/m ³ and density of				
		٧	vater as 1000 kg/m ³ .		of and density of		
	8	8. Explain meaning of term NPSH with respect to centrifugal pump.					
	9	Compare the velocity profiles for laminar and turbulent flow in pipes and comment on then				(5)	
	1	0. 0	thoose slip, percentage slip and coefficient of sl	in of			
	4	4. 11	rustrate the working principal of various single	ingle column man		(5)	
	1	2. E	xplain the important characteristics of turbulent	flov	v and laminar flow.	(5) (5)	

OR

Deduce an expression for Darcy - Welsbach formula to determine the head loss due to friction. (5)

Brainware University
Barasat, Kolkald 200125