Sur Name : Fluid Mecha Code : 4TE03FLM1	nmer Exa	JNIVERSITY mination-2018	
Name : Fluid Mecha	nnics -I		
Code: 4TE03FLM1			
		Branch: B.Tech (Civil)	
	02/04/2018	Time: 02:30 To 05:30	Marks : 70
Instructions written of Draw neat diagrams a	n main answer bo and figures (if nec	ook are strictly to be obeyed.	prohibited.
Attempt the follow	ing questions:		(
Define specific volu	ıme of fluid.		
Write the mathemat	tical representation	on of Newton's Law of viscosit	ty.
Give the height of v	vater at 1ATM pr	ressure.	
Property of a fluid b	by which its own	molecules are attracted is calle	ed
		of a weir is above the crest of	f the weir, then
(i) Cipolletti weir	(ii) Su	bmerged weir	
	eiency for a series		at the centre of
` '	` '	(iv) 75 % aries as	
Absolute pressure is	s obtained by add		
]	Attempt the follow  Attempt the follow  Define specific volu  Write the mathemat  Give the height of w  Property of a fluid to  When the water leve the weir is called as  (i) Cipolletti weir  (iii) Ogee weir  The maximum efficit the vane is given as  (i) 0 % (ii) 25 %  The rate of flow thr  (i) H (ii) H <sup>5/2</sup> Absolute pressure is write the formula to	Instructions written on main answer bed Draw neat diagrams and figures (if need Assume suitable data if needed.  Attempt the following questions:  Define specific volume of fluid.  Write the mathematical representation Give the height of water at 1ATM property of a fluid by which its own When the water level on the d/s side the weir is called as  (i) Cipolletti weir (ii) Su (iii) Ogee weir (iv)Brown The maximum efficiency for a series the vane is given as  (i) 0 % (ii) 25 % (iii) 50 % The rate of flow through a V notch v (i) H (ii) H <sup>5/2</sup> (iii) H <sup>1/2</sup> Absolute pressure is obtained by add Write the formula to calculate resultance.	Attempt the following questions:  Define specific volume of fluid.  Write the mathematical representation of Newton's Law of viscosit Give the height of water at 1ATM pressure.  Property of a fluid by which its own molecules are attracted is called When the water level on the d/s side of a weir is above the crest of the weir is called as  (i) Cipolletti weir (ii) Submerged weir  (iii) Ogee weir (iv)Broad crested weir  The maximum efficiency for a series of vanes when the jet strikes the vane is given as  (i) 0 % (ii) 25 % (iii) 50 % (iv) 75 %  The rate of flow through a V notch varies as



----- is the imaginary line drawn through the fluid in such a way that the tangent to it at any point gives the direction of velocity of flow at the

point.

l)

According to equation of continuity,

a)  $V_1/a_1 = V_2/a_2$ c)  $W_1*v_1=w_2*v_2$ 

	m)	The Bernoulli's equation is based on conservation of			
		a) Mass b) Linear Momentum			
		c) Angular Momentum d) Energy			
	n)	According to Hagen Poiseuille, the head loss in a viscous flow is given by			
Atten	npt any f	Four questions from Q-2 to Q-8			
Q-2		Attempt all questions	(14)		
(a)		The pressure outside the droplet of waters of diameter 0.04 mm is 10.32 N/cm <sup>2</sup> (atmospheric pressure). Calculate the pressure within the droplet if surface tension is given as 0.0725 N/m of water.			
	<b>(b)</b>	Write a formula to determine discharge using roughness coefficient in an open channel.	04		
	(c)	Calculate the density, specific weight and weight of one liter of petrol of specific gravity $= 0.7$ .	04		
Q-3		Attempt all questions	(14)		
	(a)	A rectangular channel conveys a discharge of 12 m <sup>3</sup> /s at a bottom width 3 m. Find the bed slope required to carry above the discharge if depth of flow is 1m. Take Chezy's C=50.	06		
	<b>(b)</b>	Explain the types of fluid with neat sketch.	06		
	(c)	Enlist the minor losses in flow through pipes.	02		
Q-4		Attempt all questions	(14)		
	(a)	Explain Pascal's law with neat sketch.	04		
	<b>(b)</b>	Explain the various types of fluid flow.	05		
	(c)	Derive Bernoulli's equation from Euler's equation of motion.	05		
Q-5		Attempt all questions	(14)		
	(a)	A Cipolletti weir of length 2 m has of head of 1 m. Find the discharge over the weir if $C_d = 0.62$ .	06		
	(b)	A rectangular plane surface is 2 m wide and 3 m deep. It lies in vertical plane in water. Determine the total pressure and position of centre on the plane surface when its upper edge is horizontal and a) coincides with water surface b) 1.5 m below the free water surface.	08		

b)  $W_1*a_1 = W_2*a_2$ 

d)  $V_1 * a_1 = V_2 * a_2$ 



Q-o		Attempt an questions	(14)
	(a)	Differentiate between stream line and path line.	05
	<b>(b)</b>	(b) Explain the terms:	
		(i) Pipes in parallel (ii) Pipes in series	
	(c)	Calculate the capillary rise in a glass tube of $0.2~\text{mm}$ diameter when immersed vertically in water. Take surface tension of water in contact with air as $0.0725~\text{N/m}$ .	04
Q-7		Attempt all questions	(14)
	(a)	Enumerate the practical applications of model analysis.	04
	<b>(b)</b>	List the classification of orifice.	03
	(c)	Explain the concept of buoyancy and metacenter with neat sketch.	07
Q-8		Attempt all questions	
	(a)	Explain Impulse momentum principal.	05
	<b>(b)</b>	Obtain an expression for the force on the vertical plate moving in the direction of	05
		jet when the jet of liquid strikes at the centre of the plate.	
	(c)	Enlist the hydraulic co-efficient with formula.	04

