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Question Paper Code: 53A04

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Agricultural Engineering

	ISUAG	304 - FLUID MECHA	ANICS AND HYDRAU	LICS		
		(Regulation	on 2015)			
Dura	ation: Three hours			Maximum: 100 I	Marks	
		Answer ALI	L Questions			
		PART A - (10 x	1 = 10 Marks			
1.	The ratio of weight of		CO1-R			
	(a) Density	(b)Specific weight	(c)Mass density	(d)Viscosit	z y	
2.	A manometer is used	to measure			CO1-R	
	(a) Low pressure.		(b) Moderate pressure	2.		
	(c) High pressure.		(d) Atmospheric press	sure.		
3.	. It is a type of flow in which the fluid particles while flowing along cO2-stream lines, also rotate about their own axis.					
	(a) Rotational flow	(b) Laminar flow	(c) Irrotational flow	(d)Vortex flo	w	
4.	The imaginary line drawn in the fluid in such a way that the tangent to any point gives the direction of motion at that point, is known as					
	(a) Path line	(b) Stream line	(c) Steak line	(d) Potential	line	
5.	The pressure of the liquid flowing through the divergent portion of a venturimeter					
	(a) Remains constant		(b) Increase			
	(c) Decrease		(d) Depends upon ma	ss of liquid		
6.	Which of the following	ng is or are the hydraul	ic coefficients?	(CO3- R	
(a) Coefficient of velocity(c) Coefficient of discharge			(b) Coefficeint of Contraction			
			(d) All of the above			

7.	The discharge over a rectangular notch is CO4							
	(a) Inversely proportional to H ^{3/2}			(b) Directly proportional	(b) Directly proportional to H ^{3/2}			
	(c) I	(c) Inversely proportional to H ^{5/2} (d) Directly proportional			to H ^{5/2}			
8.	The	sheet of water flo	CO4-R					
	(a) (Crest	(b) Sill	(c) Nappe	(d) Nacelle			
9.	Pun	np is a device which	CO5- R					
	(a) Hydraulic energy into electrical energy.							
	(b) Hydraulic energy into Mechanical energy							
	(c) Mechanical energy into hydraulic energy.							
	(d) Mechanical energy into electrical energy.							
10.	Whi	ich of the followin	ng is / are the compor	ents of centrifugal pump	CO5- R			
	(a) I	Impeller	(b) Casing	(c) Suction pipe	(d)All of above			
			PART - B (5	x 2= 10 Marks)				
11.	Defi	ine capillarity			CO1- R			
12.	2. Write continuity equation based on principle of conservation of mass							
13.	13. State the applications of Bernoulli's equation							
14.	4. Classify notches CO							
15.	5. Define Reynolds number CO							
			PART – C (5 x 16= 80 Marks)				
16.	(a)	pipe line, which limb of the matmosphere. The limb. Determined difference in leve the free surface. If the pressure	is in excess of atm nanometer contains contact between wa the pressure of wa el of mercury in the l of mercury is in leve of water in pipe line w difference in the l	ospheric pressure. The right mercury and is open to ter and mercury is in the left ter in the main line, if the imbs of U-tube is 10 cm and I with the centre of the pipe e is reduced to 9810 N/m ² evel of mercury. Sketch the	t t t t t t t			

Or

(b) An oil of viscosity 5 poise is used for lubrication between a shaft CO1- App (16)and sleeve. The diameter of the shaft is 0.5 m and it rotates at 200 r.p.m. Calculate the power lost in oil for a sleeve length of 100 mm. The thickness of oil film is 1.0 mm. Derive acceleration of a Fluid Particle in Cartesian coordinates 17. (a) CO2- App (16)Or (b) Water flows through a pipe AB 1.2 m diameter at 3 m/s and then CO2- Ana (16)passes through a pipe BC 1.5 m diameter. At C, the pipe branches. Branch CD is 0.8 m in diameter and carries one-third of the flow in AB. The flow velocity in branch CE is 2.5 m/s. Find the volume rate of flow in AB, the velocity in BC, the velocity in CD and the diameter of CE. 18. Discuss in detail water hammer in pipes with neat sketch. CO3- Ana (16)Or (b) An oil of sp. Gr. 0.8 is flowing through a venturimeter having CO3- Ana (16)inlet diameter 20 cm and throat diameter 10 cm. The oil-mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through the horizontal venturimeter. Take $C_d = 0.98$. 19. (a) Determine the height of a rectangular weir of length 6 m to be CO4-U (16)built across a rectangular channel. The maximum depth of water on the upstream side of the weir is 1.8 m and discharge is 2000 litters/s. Take $C_d = 0.6$ and neglect end contractions. (b) Explain how current meter and float is used for measuring the CO4- Ana (16)flow in a channel 20. Discuss in detail sludge pump and vacuum pump CO5- U (16)Or (b) A centrifugal pump is to discharge 0.118 m³/s at a speed of 1450 CO5-U (16)r.p.m. against a head of 25 m. The impeller diameter is 250 mm, its width at outlet is 50 mm and manometric efficiency is 75 %. Determine the vane angle at the outer periphery of the impeller.