CRM08	Rev 1.10	‹ME›	‹22-05-2021›

CONTINUOUS INTERNAL EVALUATION– 1

Dept: ME	Sem / Div: 4th	Sub: Fluid Mechanics	S Code: 18ME43
Date: 25/05/2021	Time: 9:30-11:00 am	Max Marks: 50	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

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QN		Questions	Marks	RBT	COs
		PART A			
1	a	Explain effect of variation of temperature on viscosity of liquid and gases	5	L2	CO1
	b	A 150 mm diameter vertical cylinder rotates concentrically inside another cylinder of 151 mm. Both cylinders are 250 mm high. The space between the cylinders is filled With a liquid whose viscosity is unknown. If a torque of 12 N-m is required to rotate the inner cylinder at 100 rpm, determine the viscosity of the fluid.	8	L3	CO1
	c	Derive an expression for total pressure and centre of pressure on an inclined plan surface submerged in liquid.	8	L3	CO1
	d	Define following terms: (i)Buoyancy (ii) Centre of buoyancy	4	L2	CO2
		OR			
2	a	A square plate of size 1 m x 1 m and weighing 350 N slides down an inclined plane with a uniform velocity of 1.5 m/s. The inclined plane is laid on a slope of 5 vertical to 12 horizontal and has an oil film of 1 mm thickness. Calculate the dynamic viscosity of oil.	8	L3	CO1
	b	Derive an expression for pressure intensity in case of a soap bubble.	6	L3	CO1
	c	A pipe line which is 4 m in diameter contains agate valve. The pressure at the centre of the pipe is 19.6 N/cm^2 . If the pipe is filled with oil of sp. gr. 0.87, find the force exerted by the oil upon the gate and position of centre of pressure.	7	L3	CO1
	d	Define following terms: (i) Meta centre (ii) Meta-centric Height	4	L2	CO2
		PART B			
3	a	Derive an expression for the meta-centric height of a floating body	7	L3	CO2
	b	A simple manometer (U-tube) containing mercury is connected to a pipe in which an oil of sp. gr. 0.8 is flowing. The pressure in the pipe is vacuum. The other end of the manometer is open to the atmosphere. Find the vacuum, pressure in pipe, if the difference of mercury level in the two limbs is 20 cm and height of oil in the left limb from the centre of the pipe is 15 cm below.	7	L3	CO1
	c	Stale and prove the Pascal's law.	7	L2	CO1
	d	Define following terms: i) Density ii) Specific weight. iii) Specific volume iv) Specific gravity	4	L2	CO1
		OR			
4	a	Find the volume of the water displaced and position of centre of buoyancy for a wooden block of width 20cm in and of depth 15cm, when it floats horizontally in water. The density of wooden block is 650 kg/m^3 and its length 40cm.	7	L3	CO2
	b	Find the total pressure and position of centre of pressure on a triangular plate of base 2 m and height 3 m which is immersed in	7		CO2

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		water in such a way that the plan of the plate" makes an angle of 60° with the free surface of the water. The base of the plate is parallel to water surface and at a depth of 2.5m from water surface.			
	c	Explain the phenomenon of capillarity. Obtain expression for capillary rise of a liquid	6	L2	CO1
	d	Write a short note on Vapour Pressure and Concept of continuum	5	L2	CO1

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