CONTINUOUS INTERNAL EVALUATION– 3

Dept:ME	Sem / Div:VI A	Sub:DME II	S Code:18ME62
Date:04/08/2021	Time: 3:00-4:30 pm	Max Marks: 50	Elective:N
Note: Answer any 2 full questions, choosing one full question from each part.			

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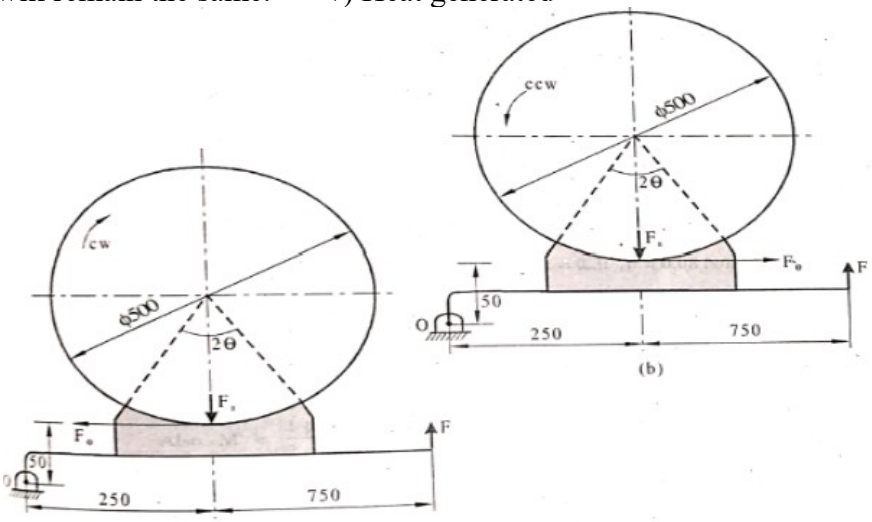
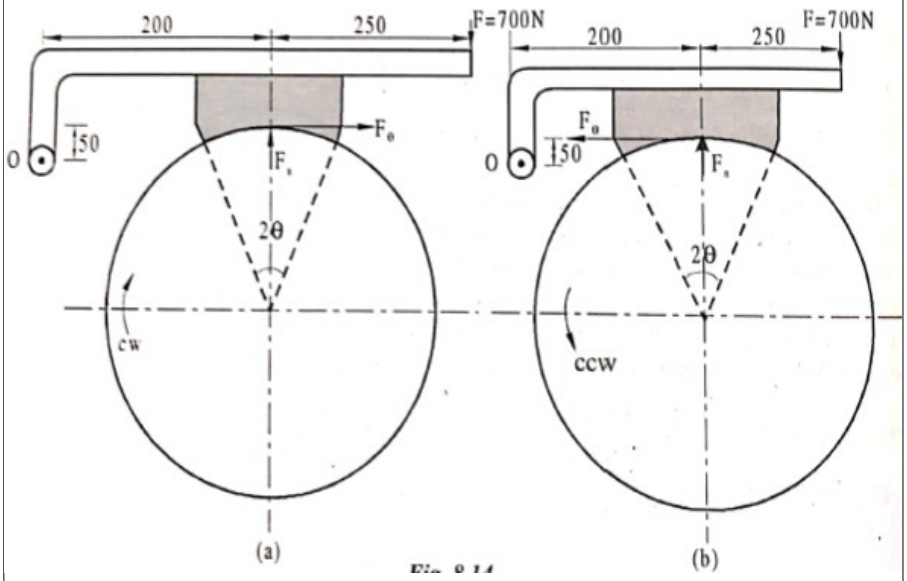
QN		Questions	Marks	RBT	COs
		PART A			
1	a	The blockbrake as shown in the figure 1.a is to balance a torque of 500Nm on a drum shaft at 1000 rpm. Assuming the coefficient of friction brake shoe and drum to be 0.25, determine i)Tangential force on the shoe ii) Normal force on the shoe iii) Force F applied to the brake for CW and CCW rotation iv) The dimension C required to make the brake self locking assuming other dimensions will remain the same. v) Heat generated  **Fig 1.a**	15	L4	CO3
	b	 **Fig.1.b** A single block brake as shown in above fig1.b has a drum diameter	10	L3	CO3

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		250mm. The contact angle is 90°. If an operating force of 700N is applied at the end of the lever and the coefficient of friction is 0.35, determine the torque that may be sustained by the brake.			
		OR			
2	a	A simple band brake of drum diameter 600mm has a band passing over it with an angle of contact of 225^0. One end of band is connected to fulcrum and other end is connected to brake lever at a distance of 400mm from the fulcrum. The brake lever is 1m long. The brake is to absorb a power of 15kW at 720 rpm. Design the brake lever of rectangular cross section, assuming depth to be thrice the width. Take the allowable stress 80MPa.	10	L4	CO3
	b	A differential band brake has an operating lever 225mm long. The ends of the brake band are attached so that their operating arms are 38mm and 127mm long. Brake drum diameter =600mm, arc of contact is 300^0 and coefficient of friction 0.22. The band is 3.2mm X 100mm long. i)Find the least force required at the end of operating lever when the band is subjected to a stress of $55N/mm^2$. ii) What is the torque applied to the brake drum shaft. iii)Is the brake self locking, Prove your answer	15	L3	CO3
		PART B			
4	a	Explain hydrodynamic theory of lubrication with a sketch	15	L2	CO4
	b	Determine the power loss for a Petroff bearing 100mm in diameter and 150mm long. The radial distance is 0.05 mm. Speed of the journal is 1000 rpm. The lubricating oil is SAE 10 and bearing operating temperature is 60^0c.	10	L3	CO4
		OR			
4	a	Derive Petroffs equation	15	L2	CO4
	b	A 75mm long full journal bearing of diameter 75mm supports a load of 10kN. The speed of the journal is 1200 rpm. The absolute viscocity of the oil is $10X10^{-3}$ Pas and diametral clearance ratio is 0.001. Determine the coefficient of friction by using i)Petroffs equation ii) Mckees equation	10	L3	CO4

Prepared by: HOD