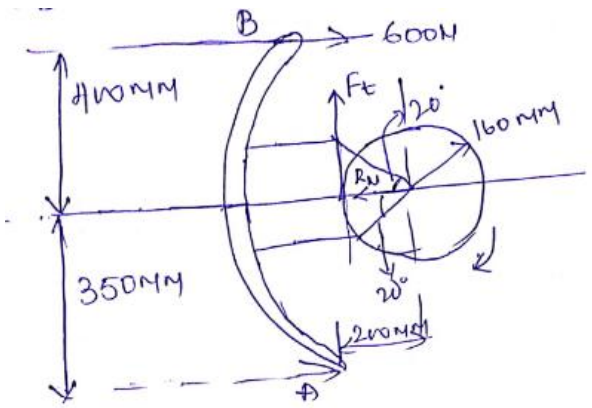
UNIT–III

S.No.		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		Differentiate between uniform pressure and uniform wear theories adopted in the design of clutches.	L2	CO3	PO2,PO4
2		How the "uniform rate of wear" assumption is valid for clutches?	L3	CO3	PO2,PO4
3		Why is it necessary to dissipate the heat generated during clutch operation?	L2	CO3	PO2,PO4
4		Define self-locking and self-energizing brake	L1	CO3	PO2,PO4
5		What is the disadvantage of block brake with one short shoe? What is the remedy?	L2	CO3	PO2,PO4
6		Why in automobiles, braking action when traveling in reverse is not as effective as when moving forward?	L2	CO3	PO2,PO4
7		What factors should be considered when designing friction clutches?	L2	CO3	PO2,PO4
8		Why are cone clutches better than disc clutches?	L3	CO3	PO2,PO4
9		What is friction axis?	L2	CO3	PO2,PO4
10		Discuss the factors upon which the torque capacity of a clutch depends and When do we use multiple disk clutches?	L2	CO3	PO2,PO4
Part – B (Long Answer Questions)					
11	a)	Deduce the equation for torque considering uniform wear for flat pivot bearing.	L2	CO3	PO2,PO4
	b)	A vertical shaft 150 mm in diameter rotating at 100 r.p.m. rests on a flat end footstep bearing. The shaft carries a vertical load of 20 kN. Assuming uniform pressure distribution and coefficient of friction equal to 0.05, estimate power lost in friction.	L2	CO3	PO2,PO4
12	a)	Deduce the equation for torque considering uniform pressure for conical pivot bearing.	L2	CO3	PO2,PO4
	b)	A conical pivot supports a load of 20 kN, the cone angle is 120º and the intensity of normal pressure is not to exceed 0.3 N/mm^2. The external diameter is twice the internal diameter. Find the outer and inner radii of the bearing surface. If the shaft rotates at 200 r.p.m. and the coefficient of friction is 0.1, find the power absorbed in friction. Assume uniform pressure	L2	CO3	PO2,PO4
13	a)	Deduce the equation for torque considering uniform wear for truncated pivot bearing.	L2	CO3	PO2,PO4
	b)	A conical pivot bearing supports a vertical shaft of 200 mm diameter. It is subjected to a load of 30 KN. The angle of the cone is 120º and the coefficient of friction is 0.025. Find the power lost in friction when the speed is 140 r.p.m., assuming 1. Uniform pressure; and 2.	L2	CO3	PO2,PO4

		Uniform wear.			
14		The external radius of a friction plate of a single plate clutch having both sides as effective, is 150mm. The power transmitted is 20KW at a speed of 1000rpm. The maximum intensity of pressure at any point of contact surface is $0.8*10^5 N/mm^2$. If the co-efficient of friction is 0.30, then determine: 1. Internal radius of friction plate. 2. Axial thrust at which the friction surfaces are held together.	L3	CO3	PO2,PO4
15	a)	Deduce the equation for a shoe brake to determine the braking torque when line of action tangential braking force passes through a distance 'a' below fulcrum	L4	CO3	PO2,PO4
	b)	Following figure shows a brake applied to a drum by a lever AB which is pivoted at a fixed point A and rigidly fixed to the shoe. The radius of drum is 160mm. The coefficient of friction at brake lining is 0.3. If the drum rotates in clockwise, calculate the braking torque due to horizontal force of 600N at B. 	L2	CO3	PO2,PO4
16	a)	With a neat sketch explain the working principle of Prony Brake Dynamometer.	L2	CO3	PO2,PO4