

- b) A pulley is driven by a flat belt running at a speed of 600 m/min. the coefficient of friction between belt and pulley is 0.3 and angle of lap is 160° . if the maximum tension in the belt is 700 N; find the power transmitted by a belt. [6]

- Q5) a) Differentiate between brakes and dynamometer. What are the factors on which the capacity of the brake depends? List common materials used for brake liners. [6]

- b) Draw and explain the Epicyclic train brake dynamometer. [7]

OR

- Q6) a) In the band and block brake, the band is lined with 'n' blocks each of which subtends an angle of 2β at the centre of the rotating drum. When the brake is in action, the greatest and least tensions in the brake strap are T_1 and T_2 , show that [8]

$$\frac{T_1}{T_2} = \left(\frac{1 + \mu \tan \theta}{1 - \mu \tan \theta} \right)^n$$

Where μ is the coefficient of friction for the blocks.

- b) In a laboratory experiment, the following data were recorded with rope brake: Diameter of the flywheel 1.2 m; speed of the engine 200 rpm; dead load on the brake 600 N; spring balance reading 150 N. Calculate the brake power of the engine. [5]

- Q7) a) Discuss the graphical method to determine equivalent dynamical system of two masses. [6]

- b) A small connecting rod of mass 1.5 kg is suspended in a horizontal plane by two wires 1.25 m long. The wires are attached to the rod at points 120 mm on either side of the centre of gravity. If the rod makes 20 oscillations in 40 seconds, find the radius of gyration and the mass moment of inertia of the rod about a vertical axis through the centre of gravity. [7]

OR

- Q8) a) Derive an expression for correction couple to be applied to make two mass system dynamically equivalent. [6]

- b) Write a short note on the following [7]

- (i) static force analysis of slider crank mechanism 07
(ii) dynamic force analysis of slider crank mechanism 04

