Question Bank for UT2 Course-TOM(313313) Program- ME4K

Unit - IV Power transmission (Belt, Chain and Gear)

2 marks questions

1) List the methods to reduce the slip in belt and pulley.

2) Write down the formula of length of belt for open belt drive and cross belt drive.

3) Define slip and creep in Belt Drive.

4) Compare open belt and cross belt drive on the basis of (i) Velocity Ratio, (ii) Application, (iii) Direction of Driven Pulley, (iv) Length of Belt

5) What do you understand by "Initial Tension" in a belt ?

6) List the types of gears

7) State the types of gear trains

8) State the advantages of chain drive over other drive

4 marks questions

1) Two parallel shafts whose centre line are 4.8 m apart, are connected by open belt drive. The diameter of the larger pulley is 1.5 m and that of smaller pulley is 1 m. The initial tension in the belt when stationary is 3 kN. The mass of the belt is 1.5 kg/m length. The coefficient of friction between the belt and pulley is 0.3. Calculate the power transmitted when the smaller pulley rotates at 400 rpm.

2) An engine running at 150 rpm, drives a line shaft by means of a belt. The engine pulley is 750 mm diameter and the pulley on the line shaft being 450 mm. A 900 mm diameter pulley on the line shaft drives a 150 mm diameter pulley keyed to a dynamo shaft. Find the speed of the dynamo shaft, when (i) There is no slip. (ii) There is a slip of 2% at each drive line. (iii) Also state the effect of slip on velocity ratio

3) In a flat belt, initial tension is 1800 N, angle of lap on smaller pulley is 170°, co-efficient of friction is 0.25. The diameter of pulley is 90 cm. It runs at 540 rpm. Find : Increase in power transmitted if initial tension is increased by 10%

4) An I.C. Engine developing 10 kW of power is to be transmitted to a machine by flat leather belt. A 0.8 m diameter pulley is fitted on engine shaft and rotates at 300 rpm. The angle of lap is 175o and coefficient of friction in belt and pulley is 0.25. Determine tensions in the belt.

5) Two Pulleys one 450 mm diameter and other 200 mm diameter are on parallel shaft is 1.95 apart and are connected by cross-belt drive. Find the length of belt required and angle of contact between the belt and each pulley. What power can be transmitted by belt, when the larger pulley rotates at 200 rpm, If maximum permissible tension in the belt is 1000 N, $\mu = 0.25$

6) Applying the knowledge of selection of drive for power transmission, select the suitable drive for following applications. Also justify your selection. (i) Electric Two Wheeler (Battery operated) (ii) Flour Mill (iii) JCB (Heavy earth moving machine) (iv) Wrist watch (Analog) (v) Stone crusher (vi) Road Roller

7) Find the width of the belt, necessary to transmit 7.5 kW to a pulley 300 mm diameter, if the pulley makes 1600 rpm and the co-efficient of friction between the belt and pulley is 0.3. Assume the angle of contact as 1800 and the maximum tension in the belt is not to exceed 8 N/mm width

9) Explain the construction of compound gear train using suitable sketch.

10) Compare Belt drive & gear drive.

11) State the advantages of 'V' belt drive over flat belt drive ?

Unit - V Balancing of Masses and Vibration

2 marks questions

1) State effects of imbalance in machine.

2) State the need of balancing in machine

3) List the types of vibrations

4) State the disadvantages of vibrations

5) State the advantages of vibrations

6) List the methods of balancing

4 marks questions

1)The four masses M1, M2, M3 & M4 are 150 kg, 200 kg, 250 kg and 210 kg respectively. The corresponding radii of rotations are 15 cm, 10 cm, 20 cm and 25 cm and the corresponding angles are 10°, 60°, 130° & 245° respectively. Find the position and magnitude of balance mass analytically and graphically, if the radius of rotation is 18 cm.

2) Four masses A, B, C & D are attached to the shaft and revolve in the same plane. The masses are 12 kg, 15 kg, 18 kg, & 20 kg respectively and their radii of rotation are 40 mm, 50 mm, 60 mm and 30 mm. The angular position of the masses B, C and D are 60°, 135° and 270° from mass A. Find the magnitude and position of the balancing mass at radius of 100 mm.

3)Four masses m1, m2, m3 and m4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radius of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively and the angles between successive masses are 45°, 75° and 135°. Find the position and magnitude of the balance mass required if its radius of rotation is 0.2 m.

4) Explain forced vibrations