Basic Mechanical Engineering

CSE/IT/Civil Engineering

POWER TRANSMISSION

1. Enlist the different modes of mechanical transmission?
2. What are the different types of the belt drives? Derive the relation for length of the belt in open belt and cross belt arrangement. Also state advantages and disadvantages of open belt and cross belt over one another.
3. What is slip and creep of the belt? Derive the relation for velocity ratio in terms of slip for flat belt drives.
4. Derive the relation for ration of tensions in tight side (T_1) and slack side (T_2) for open belt and cross belt arrangement.
5. What is centrifugal tension in the belt? Derive the relation for the same in terms of velocity of belt.
6. Write a short note on gear drives giving their merits and demerits.
7. How the gears classified and what are the various terms used in spur gear terminology?
8. What are rolling contact bearings? Discuss their advantages over sliding contact bearings.
9. Write short note on classifications and different types of antifriction bearings.
10. What are the advantages of lubrication?

Numerical

1. Two pulleys, one 450 mm diameter and the other 200 mm diameter, on parallel shafts 1.95 m apart are connected by a crossed belt. Find the length of the belt required and the angle of contact between the belt and each pulley. What power can be transmitted by the belt when the larger pulley rotates at 200 rev/min, if the maximum permissible tension in the belt is 1000 N, and the coefficient of friction between the belt and pulley is 0.25?

2. A flat belt is required to transmit 30 kW from a pulley of 1.5 m effective diameter running at 300 rpm. The angle of contact is spread over $\frac{11}{24}$ of the circumference. The coefficient of friction between the belt and pulley surface is 0.3. Determine, taking centrifugal tension into account, width of the belt required. It is given that the belt thickness is 9.5 mm, density of its material is 1100 kg / m^3 and the related permissible working stress is 2.5 MPa.