

THEORY OF MACHINE

(Theory — 2)

Full Marks : 80

Time : 3 hours

Attempt any five questions

Figures in the right-hand margin indicate marks

1. (a) Define Kinematic Chain. 2
- (b) What is lower pair ? Explain briefly different types of lower pair. 6
- (c) What is Four-bar mechanism ? Explain the different inversions of four-bar chain. 8
2. (a) State the function of cam and followers. 2
- (b) Explain the construction and working of ball bearing. 6
- (c) Derive the formula for torque transmission of flat pivot bearing with uniform wear. 8

(Turn Over)

(2)

3. (a) State the function of bearing. 2

(b) Explain the working of any one absorption type dynamometers. 6

(c) A multiple clutch has three pairs of contact surfaces. The outer and inner radii of the contact surfaces are 100 mm and 50 mm respectively. The maximum axial spring force is limited to 1 kW. If the coefficient of friction is 0.35 and assuming uniform wear, find the power transmitted by the clutch at 1500 rpm. 8

4. (a) What is the function of jockey pulley? 2

(b) Derive the length of open belt drive. 6

(c) A open belt 100 mm wide connects two pulleys mounted on parallel shafts with their centres 2.4 m apart. The diameter of the larger pulley is 450 mm and that of smaller pulley 300 mm. The coefficient of friction between the belt and the pulley is 0.3 and the

(3)

- maximum stress in the belt is limited to 14 N/mm width. If the larger pulley rotates at 120 rpm, find the minimum power that can be transmitted. 8
- (a) What do you mean by crowning of pulleys? 2
- (b) With neat sketch explain the working of fast and loose pulleys. 6
- (c) Explain the working of epicyclic gear train. 8
6. (a) Define circular pitch of a toothed gear. 2
- (b) Define sensitivity, stability and isochronism of a governor. 6
- (c) With neat sketch explain the working of a proel governor. 8
7. (a) State the difference between static and dynamic balancing. 2
- (b) Explain the concept of natural vibration, forced vibration and damped vibration. 6