

Nov - Dec - 2011

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✓ T.E. (Mechanical) (Semester – I) Examination, 2011
THEORY OF MACHINES – II
(2008 Pattern) (New)

Time : 3 Hours

Max. Marks : 100

Instructions : 1) Answer 3 questions from Section I and 3 questions from Section II.

2) Answers to the two Sections should be written in separate books.

3) Neat diagram must be drawn wherever necessary.

4) Figures to the right indicate full marks.

5) Use of logarithmic table, electronic pocket calculator is allowed.

6) Assume suitable data, if necessary.

SECTION – I

Unit – I



1. a) Derive an expression for frictional torque of conical pivot bearing, assuming uniform wear theory. 6
- b) i) Explain friction circle in turning pairs. 2
- ii) Explain friction axis of a link. 2
- c) A single plate clutch transmits 25 kW at 900 rpm. The maximum pressure intensity between the plates is 85 kN/m². The outer diameter of the plate is 360 mm. Both the sides of the plate are effective and the coefficient of friction is 0.25. Determine :
- i) The inner diameter of the plate,
- ii) The axial force to engage the clutch. 8

OR

P.T.O.



2. a) Write short note on Epicyclic Train Dynamometer. 6
- b) Explain 'self energizing' and 'self-locking' effect on block brakes. 4
- c) In a simple band brake applied to a shaft carrying a flywheel of mass 250 kg and radius of gyration 300 mm. One end of the band is attached to the fulcrum and the other at a distance of 80 mm from the fulcrum. The force is applied to the brake lever at a distance 280 mm. The angle embrace by band is 225° and drum diameter is 200 mm. $\mu = 0.25$ and the shaft speed is 200 rpm. Find :
- i) Braking torque when a force of 120 N is applied.
- ii) The number of turns of flywheel before it comes to rest.
- iii) Time taken by flywheel to come to rest. 8

Unit – II

3. A F1 at faced follower is operated by uniformly rotating cam. The follower is raised through a distance of 25 mm in 120° rotation of cam, remains in rest for the next 30° and lowered through further 120° rotation of cam. The raising is by SHM and lowering with uniform acceleration and deceleration. The least radius of cam is 25 mm which rotates at 300 rpm.

Draw the cam profile and determine the value of maximum velocity and acceleration for rise and return. 16

OR

4. a) Explain the phenomenon of jump in cam system. 4
- b) What is kinematic equivalent system ? Draw kinematic equivalent system for circular arc cam with oscillating roller follower. 4
- c) What is polynomial curve CAM ? Derive the expression for displacement, velocity and acceleration for 2-3 polynomial D-R-D cam. 8

