Exam.Code:0940
Sub. Code: 6713

2053
B.E. (Mechanical Engineering)
Fourth Semester
MEC-403: Dynamics of Machines

Time allowed: 3 Hours | Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

1. **Attempt the following:-**

1) What is meant by undercutting of gears?
2) What is the significance of a reference plane in balancing of rotating masses?
3) Differentiate between radial and offset follower.
4) What is the difference between Hammer Blow and Swaying Couple?
5) How is skidding of a four wheeler averted during turning?

(5x2=10)

PART A

2) Draw profile of a cam to give the following motion to the reciprocating follower with a flat or mushroom contact face- (a) Follower to move outward through a distance of 20mm during 120^0 of cam rotation (b) Follower to dwell for 30^0 of cam rotation (c) Follower to return to its initial position during 120^0 of cam rotation (d) Follower of dwell for the remaining 90^0 of cam rotation. Minimum radius of cam is 25mm and flat face of follower is at right angles to the lines of stroke of the follower. Outward and return strokes of the follower are to take place with simple harmonic motion

(10)

3) A Hooke's joint is used to connect two shafts. Driving shaft is rotating uniformly with a speed of 400rpm. Maximum speed of the driven shaft if 420rpm. Determine greatest permissible angle between the two shafts. Find minimum speed of the driven shaft.

(10)

P.T.O.

4) A grinding mill has one cylindrical roller weight 150kg with diameter 100cm. Driving shaft rotates at 100rpm. Determine sense of rotation of the driving shaft in order to have a crushing force more than its weight. Determine magnitude of crushing force also.

(10)

PART B

5) A pinion and a rack are in mesh. Rack is driven by pinion of 125mm pitch circle diameter. The number of involute teeth on the pinion are 20. Addendum of both pinion and rack is 6.25mm. Find least pressure angle, if interference is to be avoided.

(10)

6) Two parallel shafts are connected with the help of two gears, with one gear on each shaft. Number of teeth on one gear is 40 and speed of shaft is 500rpm. If speed ratio is 2.5 and circular pitch of gears is 24mm, then find (a) Number of teeth and speed of other shaft. (b) Centre distance between the two shafts.

(10)

7) Cranks of a 2 cylinder uncoupled inside cylinder locomotive are at right angles and 300mm long. Distance between centre lines of the cylinder is 650mm. Wheel centre lines are 1.6m apart. Reciprocating mass per cylinder is 300kg. Driving wheel diameter is 1.8m. If hammer blow is not to exceed 45kN at 100km.hr, then find (a) Maximum swaying couple (b) Variation in tractive effort

(10)

x-x-x