

Exam. Code: 0940
Sub. Code: 33857

2056
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

Q-1)

- 1) How does a Watt mechanism trace an approximate straight line?
- 2) What is the importance of trace point in cams?
- 3) What are the functions and advantages of worm and worm gear.
- 4) Explain the working a Humpage reduction gear.
- 5) What is inertia couple and correction couple?

(5x2=10)

PART A

Q-2)

Derive expressions for displacement, velocity and acceleration for a tangent cam operating a radial-translating follower when the contact is on the straight flank and when contact is on the circular nose.

(10)

Q-3)

If crank and connecting rod are 300mm and 1m long respectively, and crank rotates at a constant speed of 200rpm, then determine crank angle at which maximum velocity occurs and maximum velocity of the piston.

(10)

Q-4)

Each paddle wheel of a streamer has a mass of 1600kg and radius of gyration 1.2m. Streamer turns to port in a circle of 160m radius at 24km/hr, speed of the paddles being 90rpm. Find magnitude and effect of gyroscopic couple acting on the streamer.

(10)

P.T.O.

(2)

PART B**Q-5)**

A simple gear train consists of 2 gears only. Each gear is mounted on separate shafts which are parallel. First gear is driving the second gear. Speed of first gear is 600rpm. Number of teeth on gears first and second are 20 and 60 respectively, Determine (a) speed ratio of gear train (b) Speed of second gear.

(10)**Q-6)**

Derive an expression for the minimum number of teeth required on the pinion in order to avoid interference in an involute gear teeth.

(10)**Q-7)**

A, B, C and D are 4 masses carried by a rotating shaft at radii 100, 125, 200 and 150mm respectively. The planes in which masses revolve are spaced 600mm apart and mass of B, C and D are 10kg, 5kg and 4kg respectively. Find the required mass A and relative angular settings of the 4 masses so that shaft is in complete balance.

(10)*x-x-x*