C.V. RAMAN POLYTECHNIC, BHUBANESWAR

DEPARTMENT OF MECHANICAL ENGINEERING

SUBJECT-TOM

Question bank- 4TH Semester

CHAPTER-1

SIMPLE MECHANISM

1. Define a link give two examples.

2. What are the characteristics of link?

3. Classify the links and define each of them.

4. Explain higher pair and lower pair with examples.

5. State the types of kinematic pairs.

6. State the types of kinematic pairs according to nature of relative motion between links.

7. State the conditions for a kinematic chain.

8. State the types of chain.

9. What is kinematic pair?

10. State the different types of kinematic chain.

CHAPTER-2

FRICTION

1. What is mean by friction?

2. Write the different types of friction.

3. Prove that angle of repose is equal to angle of friction.

4. Define bearing and explain its meeting.

5. Give the confrontational detail's of foot step bearing.

6. How does the thrust bearing is differ from the journal bearing ?

7. Derive the advantage's and Disadvantages of rolling contact 's Bearing over sliding contact Bearing.

9. Write a Short note on the designation of rolling contact bearing bearing .

10. Derive the expression for power lost due to friction in journal bearing.

CAPTER – 3

POWER TRANSMISSION

1. How derive for power transmission is selected?

2. What are the advantage o belt drive's over gear drive?

3. Write a brief note on belt material's.

4. A shaft is rotating at 100 rpm carries a pully of 830 mm diameter , which drive's another shaft at 800 rpm by means of a belt 3 mm thick . determine the diameter of the pulley on drive's shaft.

5. Define Velocity ratio & slip

6. what is difference between open belt's and crossed belts?

7. Explain design of stepped pulley?

8. What is angle of laps? Write down the angle of lap for open belt drive and cross belt drive.

9. Write down expression for power transmitted belt.

10. Two pulleys 400 mm and 800 mm diameter which are fixed to two parallel shaft s 4m apart are collected by open belt. Find the length of and angle of contact.

CHAPTER - 4

GOVERONERS AND FLYWHEEL

1. What is Governor? How do you classify Governor ?
2. Explain of principle of centrifugal governor with net sketch.
Equilibrium speed, stability, isochronisms, power of governor
3. Explain briefly porter of governor .
4. Explain the function of flywheel.
5. Compare flywheel and governor.
6. State the applications of flywheel.
7. Define fluctuation of energy.
8. Define fluctuation of speed.
9. the initial speed of flywheel on a punching machine is 120 RPM. Punching operation takes 2 second and requires 22 KJ of energy. Speed must not roll fall below 90 RPM. The driving motor supplies 3000 W at 115 RPM. The loss of energy due to friction is 20% of that supplied . Determine

Moment of inertia of the flywheel
Its radius of gyration if its mass is 650 Kg.
10. The areas of above and below the mean torque line respectively are 530, 330, 380, 470, 180, 360, 350, and 280 sq.mm. The diagram has been drawn to the following scales .
Turing moment , 1mm=100Nm
Crack angle ,1mm=60

CHAPTER – 5

BALANCING OF MACHINE

1. Four masses of A, B , C and D are attached to a shaft and revolve in the some plane .the masses are 12 kg . 18 kg and 15 kg respectively and their radii of rotation are 40 mm, 50 mm. 60 mm and 30 mm. the angular position of the masses B,C and D are 60^o . 135^o and 270^o from the mass A. find the magnitude and position of the balancing mass at a reduce of 100mm.
2. why is balancing of rotating part's necessary for high speed engine's?
3. Explain clearly the term's "static balancing" and "dynamic balancing". State the necessary condition's to achieve them?
4. Four masses A, B, C, and D revolve at equal radii and are equally spaced along a shaft . the mass B is 7 kg and the radii of C and D makes angles of 90^o and 240^o respectively with radius of B . find the magnitude of the masses A. C and D and angular position of A so that the system may be completely balanced.
5.Derive the following expression for an uncoupled twom cylinder locomotive engine: variation is tractive force , swaying couple & hammer blow.
6.A single cylinder horizontal engine runs at 120rpm. The length of stroke is 400mm. The mass of the revolving parts assumed concentrate at the crank pin is 100kg and mass of the reciprocating parts is 150kg. Determine the magnitude of the balancing mass required to be a placed opposite to the crank at radius of 150mm to balance the whole of the revolving mass and two-thirds of the reciprocating mass. Determine the magnitude of the balancing mass and the resultant residual unbalance force when the crank has turned 30^o from the innerdead centre, neglect the obliquity of the connecting road.
7. A two cylinder uncoupled locomotive has inside cylinders 0.6m apart . The radius of each crank is 300mm and are at right angles. The revolving mass per cylinder 250kg and the reciprocating mass per cylinder is 300 kg. The whole of the revolving and two-third of the reciprocating masses are to be balanced and the balanced masses are placed .In the planes rotation of the driving wheels , at radius of 0.8m , the driving wheels are 2m and diameter 1.5 apart . If the speed of the engine is 80km.p.h, find hammer blow , maximum variation in tracvtive effort and maximum swaying couple.
8. An air compressed has four vertical cylinder 1,2,3 and 4 in line and the driving cranks at 90^o intervals reach their upper most position in this order .The cranks are of 150mm radius . The connecting rods 500mm long and the cylinder centre line is 400mm apart . The mass of the reciprocating parts for each cylinder is 22.5kg and the speed of rotation is 400rpm show that there are no out of balance primary or secondary process and determine the corresponding couples .Indicating the position o0f no 1.crank for maximum values . The central plane of the machine may be taken as reference plane .

CHAPTER – 6

VIBRATION OF MACINE PARTS

1. Define periodic Motion.

2. State any five examples four periodic motion.

3. State the condition four simple harmonic motion .

4. Define Simple harmonic motion And state example.

5. Define time period in SHM.

6. Define frequency of oscillations.

7. Derive expressions for Time period and frequency.

8. Define phase and initial phase in SHM.

9. Write the characteristics of an ideal simple pendulum.

10. Define Seconds pendulum.