

SECTION B

2. Sketch and explain the various inversions of a slider crank chain.
3. Draw and explain working of Pentograph.
4. Derive the condition for maximum power transmission in a flat belt drive.
5. Describe with a neat sketch a centrifugal clutch and deduce an equation for the total torque transmitted.
6. Explain the terms and derive expressions for 'effort' and 'power' of a Porter governor.

SECTION C

7. A shaft which rotates at a constant speed of 160 r.p.m. is connected by belting to a parallel shaft 720 mm apart, which has to run at 60, 80 and 100 r.p.m. The smallest pulley on the driving shaft is 40 mm in radius. Determine the remaining radii of the two stepped pulleys for a crossed belt and later for an open belt. Neglect belt thickness and slip.
8. A three cylinder single acting engine has its cranks set equally at 120° and it runs at 600 r.p.m. The torque-crank angle diagram for each cycle is a triangle for the power stroke with a maximum torque of 90 N-m at 60° from dead centre of corresponding crank. The torque on the return stroke is sensibly zero. Determine power developed. Also find coefficient of fluctuation of speed, if the mass of the fly wheel is 12 kg and has a radius of gyration of 80 mm. Also find coefficient of fluctuation of energy and maximum angular acceleration of the flywheel.
9. A cam drives a flat reciprocating follower in the following manner : During first 120° rotation of the cam, follower moves outwards through a distance of 20 mm with simple harmonic motion. The follower dwells during next 30° of cam rotation. During next 120° of cam rotation, the follower moves inwards with SHM. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25 mm. Draw the profile of the cam.