

(ME5004)
(DYNAMICS OF MACHINE)

1. (a) Define D- Alembert's principle?
 - (b) Define the coefficient of fluctuation of speed?
 - (c) Write the crank effort or torque on a crankshaft?
 - (d) Obtain the angular velocity and acceleration of connecting shaft?
 - (e) The crank and connecting rod of a vertical petrol engine running at 1800rpm are 60mm,270mm respectively. The diameter of piston is 100mm and the mass of reciprocating part is 1.2 kg during the expansion stroke when the crank has turned at 20° from the dead centre the gas pressure is 650 KN/m^2 .determine the net force on a piston ,pin and thrust on a cylinder wall ?
2. (a) Define and explain inertia and inertia torque ?
 - (b) Define the coefficient of fluctuation of Energy?
 - (c) Explain And Derive Displacement, velocity and acceleration of piston?
 - (d) The three cylinder single acting engine has its crank set equally 120° and it turn at 750rpm the torque crank angle diagram for each cycle is triangle for the power stroke with a max. torque of 100N-m at 60° of the dead centre of corresponding crank. The torque on a return stroke is sensible zero .determine fluctuation of speed if the mass of flywheel is 15 kg and radius of gyration is 90mm power developed , max. angular acceleration of the flywheel ?
 - (e) The speed of engine varies from 210 rad/sec and 190rad/sec during the cycle the change in kinetic energy is found to be 0.4KJ.determine the mass moment of inertia of flywheel ??
- 3.(a) What is governor and write its uses ?
4. (b) Classification of governor?
 - (c) Write the gravity controlled governor?
 - (d) Derive the expression for height of watt governor?
 - (e) Determine the max and min speed and range of speed for an open arm type watt governor ,longer arm is 150 mm and sleeve is 25mm when angle change from 35° to 30° ?
4. (a) Define watt governor and its limitation?
 - (b) Define loaded type governor and its type ?
 - (c) Differentiate between Flywheel and governor ?
 - (d) Obtain the expression for height of porter governor ?
 - (e) In a porter governor upper and lower arm are 200mm and 250mm respectively and pivoted on axis of rotation the mass of central load is 15 kg and mass of each ball is 2kg and friction of sleeve is equal to load 25 N at sleeve .If limiting inclination of upper arm to vertical are 30° to 40° find friction ,range of speed of governor?