

Exam.Code:0939
Sub. Code: 33843

2125
B.E. (Mechanical Engineering)
Third Semester
MEC-303: Kinematics of Machines

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

1	a) What is the difference between locked chain and unconstrained chain? b) What is Least squares technique in Kinematic synthesis of mechanisms? c) What is hunting of governor? d) What is Bevis-Gibson flash light dynamometer? e) Explain slip of belt?	(5×2)
Section A(Attempt any two questions)		
2	a) What is inversion of Mechanism? Explain Whitworth quick return Mechanism b) A single slider crank chain has crank OB =100 mm and Connecting rod AB= 400 mm. Crank is making angle of 45 degrees with horizontal and rotating clockwise with angular velocity of 10 rad/sec. Find the velocity of slider A and angular velocity of connecting rod AB.	4 6
3	a) What is Freudenstein's equation? Derive it for four Bar Mechanism. b) The flywheel of a steam engine has a radius of gyration of 1 m and mass 2500 kg. The starting torque of the steam engine is 1500 N-m and may be assumed constant. Determine: 1. the angular acceleration of the flywheel, and 2. the kinetic energy of the flywheel after 10 seconds from the start.	5 5
4	a) A punching press is driven by a constant torque electric motor. The press is provided with a flywheel that rotates at maximum speed of 225 r.p.m. The radius of gyration of the flywheel is 0.5 m. The press punches 720 holes per hour; each punching operation takes 2 second and requires 15 kN-m of energy. Find the power of the motor and the minimum mass of the flywheel if speed of the same is not to fall below 200 r. p. m. b) Draw and explain turning moment diagram of four stroke cycle IC engine.	7 3
Section B(Attempt any two questions)		
5	a) A Proell governor has equal arms of length 300 mm. The upper and lower ends of the arms are pivoted on the axis of the governor. The extension arms of the lower links are each 80 mm long and parallel to the axis when the radii of rotation of the balls are 150 mm and 200 mm. The mass of each ball is 10 kg and the mass of the central load is 100 kg. Determine the range of speed of the governor. b) Explain the working of Wilson Hartnell governor.	7 3
6.	a) Explain and differentiate cone clutch and centrifugal clutch. b) What is Band and Block brake?How will you compute braking torque in such type of brake?	5 5

P.T.O.

