D Y PATIL RAMRAO ADIK INSTITUTE OF TECHNOLOGY NAVI MUMBAI

RAMRAO ADIK INSTITUTE OF TECHNOLOGY, NERUL

F.E. TERM TEST – II 2015-16

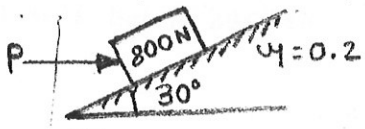
SUBJECT – ENGINEERING MECHANICS

SET – A

Time – 1 Hrs M. Marks – 30

Q. 1 a) State the conditions of equilibrium of force system for forces in space 02

Q. 1 b) Find the horizontal force P to impend the motion of block up the plane as shown in figure (1) 08



OR

Q. 1 b) Three forces acting at point A(5,2,-4)m are directed away from A towards points B(0,1,8), C(5,3,2) and D(-2,6,-1) respectively. The magnitudes of the 3 forces are F_{AB} = 150N; F_{AC}=200N; F_{AD}=350N. Find the resultant force. 08

Q. 2 a) Explain x-t, v-t and a-t curves 02

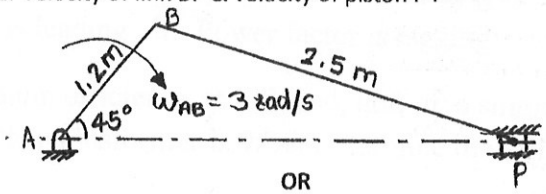
Q. 2 b) A ball is projected vertically up from the top of a building 80m high with initial velocity 12 m/s. Find time required to reach ground. Also find velocity with which it hits the ground. 08

OR

Q. 2 b) Acceleration of a particle is a = (60 - $36t^2$). The particle starts from rest. Determine (i) Velocity when displacement is 60m,
(ii) Time taken by the particle to come to rest again.

Q. 3 a) Define Instantaneous Centre of Rotation. 02

Q. 3 b) Crank AB rotates clockwise with angular velocity 3rad/s as shown in figure (2). Find angular velocity of link BP & velocity of piston P . 08



OR

Q. 3 b) For the given mechanism, V_B = 1.2 m/s as shown in figure (3). Find angular velocities of link OA and AB 08