**GE8292-ENGINEERING MECHANICS**

**UNIT-IV DYNAMICS OF PARTICLES**

10MARKS

1. A motor starts from rest and **uniformly accelerated** to speed of 20 kmph over a distance of 200m. Calculate the acceleration and time taken. If further acceleration raises the speed to 50 kmph in 8seconds, find the acceleration and the further distance moved?
2. A car ‘A’ starts from rest with **uniform acceleration** of 0.6m/s2. A second car B starts from the same point after 10seconds. The car B follows the same route with an acceleration of 1.2m/s2. Determine the time necessary to overcome the car A, and the distance covered when B passes A.
3. A body moving with **uniform acceleration** is observed to travel 33m in 8th second and 53m in 13th second of its travel. Calculate the velocity at start and uniform acceleration.
4. A particle moving with an uniform acceleration travels 10m in the 4th seconds and 18m in 6th seconds. Calculate the velocity at start of the body and **uniform acceleration.**
5. A particle moves along a straight line with **variable acceleration**. If the displacement is measured in m, and given by the relation interms of time taken t, as below.

**S=3t3+2t2+7t+3**

Determine (i) the velocity of the particle at start and after 3seconds.

(ii) The acceleration of the particle at start and after 3seconds.

1. The equation of motion of a particle moving in a straight line with **variable acceleration** is given by,

**S=15t+3t2-t3** in which‘s’ is the distance measured in ‘m’ and the time‘t’ is measured in seconds. Calculate, (i) the velocity and acceleration at start

(ii) The time, at which the particle attains its maximum velocity

(iii) The maximum velocity of the particle.

1. A body moves along a straight line so that its displacement from a fixed point on the line is given by **s=4t3-6t2+20**. Find the displacement, velocity and acceleration at the end of 3seconds.
2. A particle starting from rest, moves in a straight line and its acceleration is given by **a=50-36t2 m/s2** where t is in sec. determine the velocity of the particle when it has traveled 52m.
3. The equation of motion of a particle is given, acceleration (a) in terms of time (t) as below. **a=3t2+2t+4**, in which acceleration is in m/s2 and time‘t’ is in seconds. It is observed that the velocity

Of the particle is 12m/s after 4seconds; and the displacement of the particle is 8m after 4seconds. Determine (i) velocity after 8seconds

(ii) Displacement after 2seconds.

1. A particle moves along a straight line with an acceleration described by the equation, **a= (3t2-6),** in which ‘a’ is in m/s2 and t is in seconds. It is observed that distance travelled by the particle is 6m at the end of 2seconds and 10m at the end of 3seconds. Calculate,

(i) Velocity after 10 seconds.

(ii) Displacement after 8 seconds.