A.A.V. PATEL JUNIOR COLLEGE
EXCELLENCE PROGRAM S.Y.J.C TUTORIAL

PHYSICS

CIRCULAR MOTION (M.M-25M)

Question 1 to 5 carry 1M each.

Q.1. Define period and frequency of particle

Q.2. Define angular displacement. State vector relation between angular displacement and linear displacement.

Q.3. What is banking of roads?

Q.4 Why work done by centripetal force is zero?

Q.5. A turntable rotates at 100 rev/min. Calculate its angular speed in rad/s and in degree/s.

Question 6 to 8 carry 2M each.

6. Distinguish between centripetal force and Centrifugal force.

7. Draw a diagram showing all components of forces acting on a vehicle moving on a curved banked road.

8. A racing car completes 5 rounds on a circular track in 2 minutes. Calculate the radius of track if the car has uniform centripetal acceleration $\pi^2 m/s^2$

Question 9 to 11 Carry 3M each.

9. Obtain an expression for the maximum safety speed of vehicle on a banked road.

10. Derive an expression for centripetal acceleration (radial acceleration) in uniform circular motion, by geometrical method.

11. A stone of mass 1kg is whirled in a horizontal circle attached at the end of 1m long string. If the string makes an angle of 30^0 with vertical Calculate its period and centripetal force ($g = 9.8\ m/s^2$)

Question 12 carry 5M each.

12. Derive an expressions for linear velocity at lowest point, midway and top position, for a particle revolving in a vertical circle if it has to just complete circular motion without string slackening at top.