NEW STANDARD ACADEMY
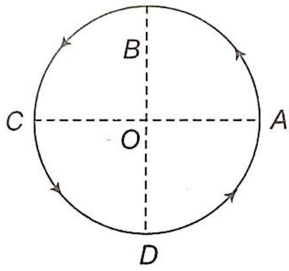
PHYSICS

1. Two projectiles are thrown with different velocities and at different angles so that they cover the same maximum height. Show that the sum of the times taken by each to reach the highest point is equal to the total time taken by either of the two projectiles.

2. A projectile has a range of 60 m and reaches a maximum height of 12 m. Calculate the angle at which the projectile is fired and initial velocity of projection of projectile. Given $g = 10$ ms^{-2}.

3. A man swims perpendicular w.r.t. river flow with a constant acceleration (in y direction) and river is flowing with a constant velocity in the x-direction. The trajectory of man seen from ground will be

4. A particle is projected from a point on the surface of smooth inclined plane (see figure) Simultaneously another particle Q is released on the smooth inclined plane from the same position. P and Q collide on the inclined plane after t = 4 second. The speed of projection of P is
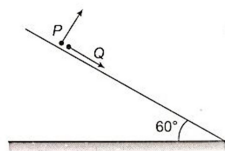
5. A car follows a truck on a perfectly straight road, both vehicles traveling at 72 km/h speed. What minimum distance should be observed by the car in order to avoid flying stones from the rear wheels of the truck?

6. A particle of mass m is projected at an angle of 60° with a velocity of 20 m/s relative to the ground from a plank of same mass m which is placed on smooth surface Initially plank was at rest. The minimum length of the plank for which the ball will fall on the plank itself is $(g = 10$m$/$s$^2)$
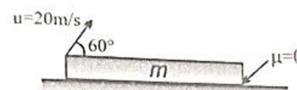
7. A projectile will cover the maximum vertical distance in the minimum time when the angle of projection with vertical is?

8. Figure shows a body of mass m moving with a uniform speed v along a circle of radius r. The change in velocity in going from A to B is

9. For a particle in circular motion the centripetal acceleration is?

10. A fan is making 600 revolutions per minute. If after some time it makes 1200 revolutions per minute, then increase in its angular velocity is

CHEMISTRY

1. Draw the Born-Haber cycle for $MgCl_2$ (S)
2. Define Solvation or Hydrations and write its applications
3. what do you by formal charge

4. What is Hydrogen bonding. Explain its types

5. Draw the resonating structures of the following:
    i)   O-nitrophenol
    ii)   Benzene
    iii)   Sulphate ion

6. Explain the shape and Hybridization in CO_3^{2-} ion

7. Explain the shape and Hybridization in IF_3 on the Basis of VSEPR Theory

8. what is dipole moment write its applications

9. Draw the energy level diagrams for O_2^{2-}, & write its magnetic behavior, Bond order and electronic configuration-

10. How bond energy varies from N_2^- to N_2^+ and why?

MATHS

1. If sec α and cosec α are the roots of $x^2-px+q+0$, then p^2 is

2. Solve: $2\cos^2\theta + 3\sin\theta = 0$

3. The value of $\sec 11° . \sec 19° - 2\cot 71°$ is equal to

4. Solve: $7\cos^2\theta + 3\sin^2\theta = 4$

5. In ΔABC, tan A : tan B : tan C = 3:4:5, then the value of sinA sinB sin C is

6. If $\frac{\sin(\theta+A)}{\sin(\theta+B)} = \sqrt{\frac{sin2A}{sin2B}}$ then $tan^2\theta =$

7. If $15\sin^4\alpha + 10\cos^4\alpha = 6$ then the value of $8\csc^6\alpha + 27\sec^6\alpha$ is

8. In ΔABC, sinA +sin B +sin C =$1+\sqrt{2}$ and cos A + cosB +cos C = $\sqrt{2}$ the triangle is

9. If $A + B + C = \frac{\pi}{2}$ then $\sum \frac{\cos(B+C)}{\cos B \cos C}$ is

10. The numerical value of $\tan\frac{\pi}{3} + 2\tan\frac{2\pi}{3} + 4\tan\frac{4\pi}{3} + 8\tan\frac{8\pi}{3}$ is

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