21. The displacement x of a particle along a straight line at time t is given by $x = a_0 + a_1 t + a_2 t^2$. The acceleration of the particle is

    (1) a_0 (2) a_1 (3) $2a_2$ (4) a_2

22. An electron starting from rest has a velocity that increases linearly with the time that is $v = kt$, where $k = 2m/sec^2$. The distance travelled in the first 3 seconds will be

    (1) 9 m   (2) 16 m   (3) 27 m   (4) 36 m

23. If a body having initial velocity zero is moving with uniform acceleration 8 m/s² the distance travelled by it in fifth second will be

    (1) 36 meters   (2) 40 meters   (3) 100 meters   (4) Zero

24. A car moving with a speed of 40 km/h can be stopped by applying brakes after at least 2 m. If the same car is moving with a speed of 80 km/h, what is the minimum stopping distance?

    (1) 8 m   (2) 2 m   (3) 4 m   (4) 6 m

25. The position x of a particle varies with time t as $x = at^2 - bt^3$. The acceleration of the particle will be zero at time t equal to

    (1) $\dfrac{a}{b}$ (2) $\dfrac{2a}{3b}$ (3) $\dfrac{a}{3b}$ (4) Zero

26. Two bodies of different masses m_a and m_b are dropped from two different heights a and b. The ratio of the time taken by the two to cover these distances are

    (1) $a:b$ (2) $b:a$

    (3) $\sqrt{a}:\sqrt{b}$ (4) $a^2:b^2$

27. A body is thrown vertically upwards. If air resistance is to be taken into account, then the time during which the body rises is
    (1) Equal to the time of fall
    (2) Less than the time of fall
    (3) Greater than the time of fall
    (4) Twice the time of fall

28. A stone dropped from the top of the tower touches the ground in 4 sec. The height of the tower is about

    (1) 80 m   (2) 40 m   (3) 20 m   (4) 160 m

29. A stone thrown upward with a speed u from the top of the tower reaches the ground with a velocity $3u$. The height of the tower is

    (1) $3u^2/g$ (2) $4u^2/g$ (3) $6u^2/g$ (4) $9u^2/g$

30. A body starts to fall freely under gravity. The distances covered by it in first, second and third second are in ratio

    (1) $1:3:5$ (2) $1:2:3$ (3) $1:4:9$ (4) $1:5:6$