Expected Questions from Simple Harmonic Motion Discussion

1. A particle executes S.H.M It will experience maximum force
   a. At extreme position
   b. At mean position
   c. In between the mean and extreme position
   d. Force is same at all positions
2. A body is vibrating S.H.M The acceleration of the particle is
   a. Minimum at extreme position
   b. Maximum at extreme position
   c. Maximum at mean position
   d. Always constant
3. A particle is executing S.H.M, the displacement of the particle in one time period is
   a. A
   b. 2A
   c. 4A
   d. Zero
4. Velocity of a particle executing S.H.M is
   a. Maximum at mean position
   b. Maximum at extreme position
   c. Always constant
   d. None of above
5. Kinetic energy of particle is maximum when it is
   a. At extreme position
   b. At mean position
   c. Mid way between mean and extreme position
   d. K.E. remains constant throughout the motion
6. In S.H.M, potential energy is maximum when particle is
   a. At extreme position
   b. At mean position
   c. In between mean and extreme positions
   d. Same at all positions
7. A particle is executing simple Harmonic Motion. Total energy of the particle is
   a. Maximum at mean position
   b. Minimum at extreme position
   c. Maximum at mean position
   d. Same at all position
8. In S.H.M., velocity of particle when displacement is half of amplitude (a) is
   a. ωa
   b. $\frac{\omega a}{\sqrt{2}}$
   c. $\frac{\omega a}{2}$
   d. $\frac{\sqrt{3}}{2}\omega a$
9. A particle executing S.H.M. has an amplitude of 1 meter and Time period 2 sec. What is the velocity when displacement is 0.5m.
   a. 3.14m/s
   b. 2.72 m/s
   c. 2.32 m/s
   d. 1.56 m/s
10. Time period of particle executing S.H.M. is T. In what time the particle will cover half of maximum displacement from mean position
    a. $\frac{T}{2}$
    b. $\frac{T}{4}$
    c. $\frac{T}{8}$
    d. $\frac{T}{12}$
11. A particle executes a S.H.M. with time period 12 second. Time taken by the particle to go directly from its mean position to half the completed is
    a. 12 sec
    b. 6 sec
    c. 3 sec
    d. 1 sec
12. Kinetic energy of a particle in S.H.M. when displacement is y is
    a. $\frac{1}{2}m\omega^2 a$
    b. $\frac{1}{2}m\omega^2 a^2$

c. $\frac{1}{2}m\omega^2(a^2 - y^2)$ d. $\frac{1}{2}m\omega^2 y^2$

13. A particle of mass 0.1kg vibrate in S.H.M. with an amplitude of 0.2m. If time period is 2.0 s, What is its maximum kinetic energy.
    a. 19.7 x 10⁻³ J
    b. 19.7 x 10⁻² J
    c. 1.97 J
    d. 19.7 J

14. The total energy of a particle executing S.H.M. is
    a. Directly proportional to amplitude
    b. Directly proportional to square of amplitude
    c. Inversely proportional to amplitude
    d. Inversely proportional to square of amplitude

15. A particle is in S.H.M. with an amplitude of 4 cm. at what displacement from equilibrium position is its energy half-potential and half-kinetic
    a. 1 cm
    b. $\sqrt{2}cm$
    c. 2 cm
    d. $2\sqrt{2}cm$

16. A small mass resets on horizontal platform, which vibrates vertically in simple harmonic motion with a period of 1 sec. what is the maximum amplitude of the motion, which will allow the mass to remain in constant with the plat form throughout the motion. (g=10m/s²)
    a. 6.3 cm
    b. 12.6 cm
    c. 25.2 cm
    d. 31.5 cm

17. In S.H.M., the maximum K.E. is equals to
    a. Maximum P.E.
    b. $\frac{1}{2}\max P.E.$
    c. $\frac{1}{2}total\ energy$
    d. Done

18. The time period of simple pendulum is independent of
    a. Length of the string
    b. Acceleration due to gravity
    c. Mass of the bob
    d. Angular velocity

19. Time period of simple pendulum is
    a. $2\pi\sqrt{\frac{g}{L}}$
    b. $2\pi\sqrt{\frac{L}{g}}$
    c. $\frac{1}{2\pi}\sqrt{\frac{g}{L}}$
    d. $\frac{1}{2\pi}\sqrt{\frac{L}{g}}$

20. Which of the following represents a simple harmonic motion
    a. y= sinωt – cosω t
    b. y=sin²ωt
    c. y=sinωt + sin2ωt
    d. y=sinωt – sin2ωt