Yakeen NEET 2.0 (2026)

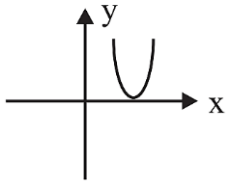
KPP-05

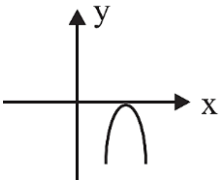
Physics by Saleem Sir **Time limit 30 minutes**

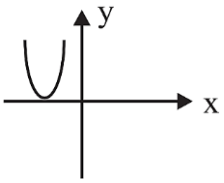
Basic Maths and Calculus (Mathematical Tools)

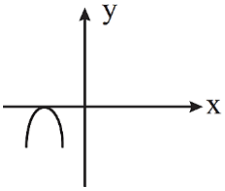
Solve without answer. When we will discus check your ansewer.

1. Correct graph of $y = -(x + 2)^2$ is:

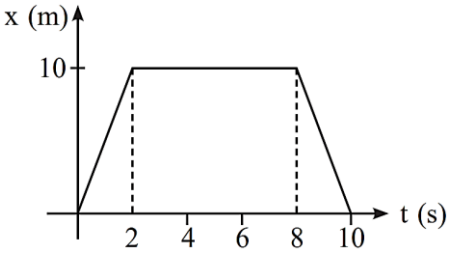
(1) 

(2) 

(3) 

(4) 

2. The position-time graph for a particle moving along a straight line is shown in figure. The total distance travelled by it in time $t = 0$ to $t = 10$ s is:



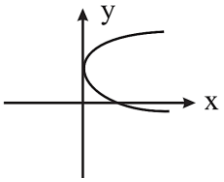
(1) Zero

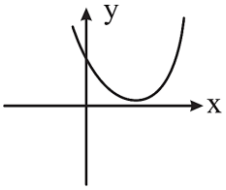
(2) 10 m

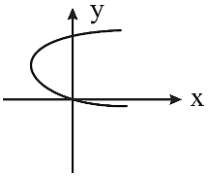
(3) 20 m

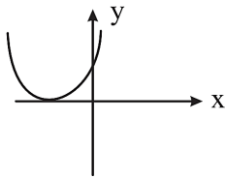
(4) 80 m

3. Graph of $y = 2(x + 1)^2 + 2$ is:

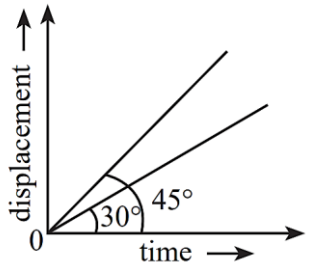
(1) 

(2) 

(3) 

(4) 

4. The displacement time graphs of two moving particle make angles of 30° and 45° with the x-axis as shown in the figure. The ratio of their respective velocity is: **(NEET-2022)**



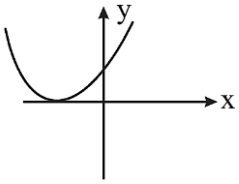
(1) $1:\sqrt{3}$

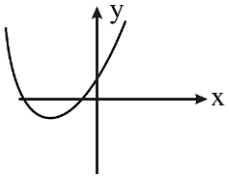
(2) $\sqrt{3}:1$

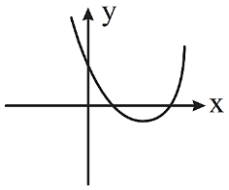
(3) 1 : 1

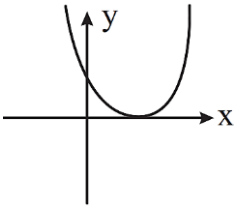
(4) 1 : 2

5. Graph of $y = 3x^2 - 4x + 1$ is:

(1) 

(2) 

(3) 

(4) 

6. In quadratic equation $ax^2 + bx + c = 0$, if discriminant is $D = b^2 - 4ac$, then roots of the quadratic equation are : (choose the correct alternative)

(1) Real and distinct, if $D > 0$
(2) Real and equal (ie., repeated roots), if $D = 0$.
(3) Non-real (i.e. imaginary), if $D < 0$
(4) All of the above are correct

7. The equation of a curve is given as $y = x^2 + 2 - 3x$. The curve intersects the x-axis at

(1) (1, 0)
(2) (2, 0)
(3) Both (1) and (2)
(4) No where

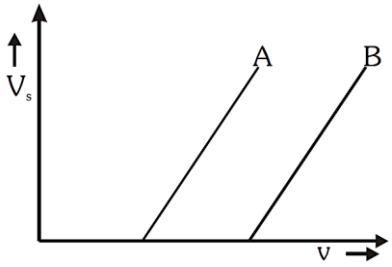
8. Two particles A and B are moving in XY-plane. Their positions vary with time t according to relation:

$x_A(t) = 3t, \quad x_B(t) = 6$
$y_A(t) = t, \quad y_B(t) = 2 + 3t^2$

Distance between two particles at $t = 1$ is:

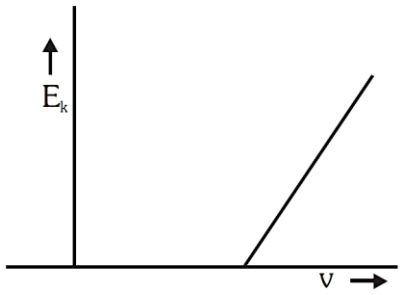
(1) 5 (2) 3
(3) 4 (4) $\sqrt{12}$

9. The stopping potential as a function of frequency of incident radiation is plotted for two different surfaces A and B. The graphs show that the work function of A is: use $h\nu = \phi + ev_s$



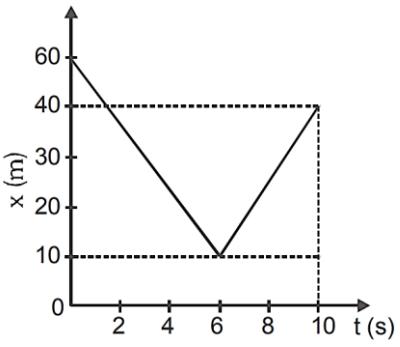
(1) Greater than that of B
(2) Smaller than that of B
(3) Same as that of B
(4) No comparison can be done from given graphs

10. Graph is plotted between maximum kinetic energy of electron with frequency of incident photon in Photo electric effect. The slope of curve will be:
Use $h\nu = \phi + (KE)_{max}$



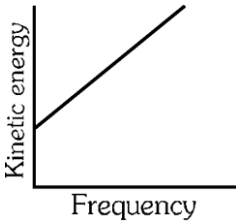
(1) Charge of electron
(2) Work function of metal
(3) Planck's constant
(4) Ratio of Planck constant and charge of electron

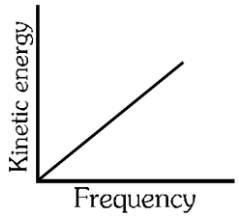
11. The fig. shows the position time graph of a particle moving on a straight line path. What is the magnitude of average velocity of the particle over 10 seconds?

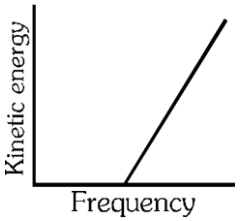


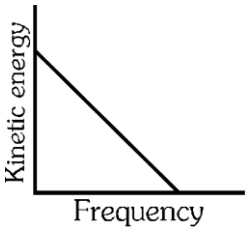
(1) 2 m/s (2) 4 m/s
(3) 6 m/s (4) 8 m/s

12. According to Einstein's photoelectric equation, the graph between the kinetic energy of photoelectrons ejected and the frequency of incident radiation is: Use $h\nu = \phi + (KE)_{max}$

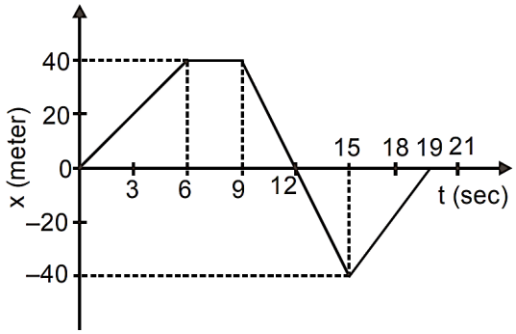
(1) 

(2) 

(3) 

(4) 

13. A person walks along an east-west street and a graph of his displacement from home is shown in figure. His average velocity for the whole time interval is:



(1) 0
(2) 23 m/s
(3) 8.4 m/s
(4) None of above

14. The values of θ in interval $\left[0, \frac{\pi}{2}\right]$ for which $10\cos^2\theta - 11\cos\theta + 3 = 0$:

(i) 30° (ii) 37°
(iii) 53° (iv) 60°
(1) (i) and (iii) (2) (i) and (ii)
(3) (iii) and (iv) (4) (ii) and (iii)

15. Find $\frac{dy}{dx}$, when

(i) $y = \sqrt{x}$
(ii) $y = x^5 + x^4 + 7$
(iii) $y = x^2 + 4x^{-1/2} - 3x^{-2}$

16. Solve the equation $2x^2 + 5x - 12 = 0$

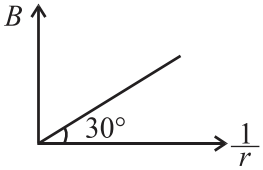
17. Draw the graph of following curve.

(i) $y = \sqrt{x}$
(ii) $y = -\sqrt{x}$
(iii) $y = \sqrt{-x}$
(iv) $y = -\sqrt{-x}$
(v) $y = x^2$
(vi) $y = -x^2$
(vii) $y^2 = x$
(viii) $y^2 = -x$

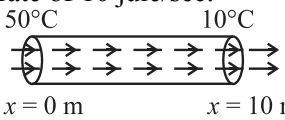
18. If magnetic field due to infinite wire at a distance r is given by:

$B = \frac{2ki}{r}$ where $k = 10^{-7}$ (In SI system)

If B Vs $\frac{1}{r}$ graph is given. Find Value of current in wire.

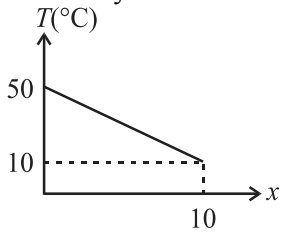


19. Suppose in following metal rod heat is flowing at constant rate of 10 jule/sec.



If area of cross section is 2 m^2. Find value of thermal conductivity if temperature of ends are fixed at 50°C and 10°C and graph is given

Use ($\frac{dQ}{dt} = KA\frac{dT}{dx}$ = rate of heat flow). Where K is thermal conductivity and A is area of cross-section



20. Graph between electric potential vs $\frac{1}{r}$ due to a point chare is plotted as shown in daigram. Find value of charge if potential due to point charge 'q' at distance 'r' is given by:

$v = \frac{kq}{r}$ $\left(\text{where } k = 9\times10^9\right)$