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If you're seeing this message, it means we're having trouble loading external resources on our website. If you're behind a web filter, please make sure that the domains *.kastatic.org and *.kasandbox.org are unblocked. In this page we have Motion Graphs Worksheet with Answers . Hope you like them and do not forget to like , social share and comment at the end of the page. Question 1 A ball is dropped vertically from a height h above the ground .It hits the ground and bounces up vertically to a height h/2.Neglecting subsequent motion and air resistance ,its velocity v varies with the height h as Solution. Before hitting the ground ,the velocity v is given by $v\sqrt{2}=2gh$ \$ Which is a Quadratic equation and hence parabolic path. Downward direction means negative velocity , After collision ,the velocity becomes positive and velocity decreases Further initial upward will be given by $v\sqrt{1^2=2g(\frac{h}{2})}=gh$ \$ Therefore $v=v\sqrt{1\sqrt{2}}$ \$ As the direction is reversed and speed is decreased and it becomes zero at height h/2 Hence (a) is the answer Question 2 The displacement -time graph of a moving particle is shown below.The instantaneous velocity of the particle is negative at the point (a) C (b) D (c) E (d) B Solution. The instantaneous velocity is given by the slope of the displacement time graph. Since slope is negative at point B, instantaneous velocity is negative at B Hence (d) is correct Question 3The velocity -time graph of a moving particle is shown below.Total displacement of the particle during the time interval when there is non zero acceleration and retardation is (a) 60 m (b) 40 m (c) 50 m (d) 30 m Solution. Acceleration is given by the slope of the velocity time graph Non zero acceleration happened in the time interval 20 to 40 sec as the slope of the graph is non zero in that time interval Now displacement in that interval is given by the area enclosed the v-t curve during that interval So area=(1/2)20*3 +20*1=50 m Hence (c) is correct Question 4 Figure below shows the displacement -time graph of two particles.Mark the correct statement about their relative velocity (a) It first increases and then decreases (b) It is a non zero constant (c) it is zero (d) none of the above Solution The instantaneous velocity is given by the slope of the displacement time graph. As slope of both the particle displacement time graph is constant.That means there individual velocities are constant. So relative velocity is also constants so it is a non zero constant as they have different velocity Hence (b) is correct Linked Type Comprehensions Four position -time graph are shown below. (a) (b) (c) (d) Question 5 What all graph shows motion with positive velocities (a) a and c only (b) all the four (c) b and D only (d) b only Solution The instantaneous velocity is given by the slope of the displacement time graph. Since slope is positive in graph a and c.Positive velocity is there in a and c curve Hence (a) and (c) are correct Question 6 What all graph shows motion with negative velocities (a) a and b only (b) all the four (c) a and c only (d) c only Solution The instantaneous velocity is given by the slope of the displacement time graph. Since slope is negative in graph b and d.Negative velocity is there in b and d curve Hence (b) and (d) are correct Question 7which of the following graph correctly represents velocity-time relationships for a particle released from rest to fall under gravity (a) (b) (c) (d) Solution The velocity will increase with time so b is the correct answer Hence (b) is correct Question 8The v-x graph of a particle moving along a straight line is shown below.Which of the below graph shows a-x graph (a) (b) (c) (d) Solution The equation for the given graph is $y=-(\frac{v}{0})(x-0)x+v-0$ \$---(1) Differentiating both sides we get $\frac{d}{dt}(\frac{dv}{dx})(\frac{dx}{dt})=-\frac{dv}{dt}(\frac{v}{0})(x-0)$ \$---(2) Now $a=-v(\frac{dv}{dx})(\frac{dx}{dt})$ \$ or $a=(-\frac{v}{0})(\frac{v}{0})(\frac{dx}{dt})-(\frac{v}{0})(x-0)x+v-0$ \$ or $a=mx+c$ \$ where $m=-\frac{v}{0}(\frac{v}{0^2})(\frac{dx}{dt})$ \$ and $c=-\frac{v}{0}(\frac{v}{0^2})(x-0)$ \$ So that means slope is positive and intercept is negative So (d) is correct Question 9 Among the four graphs given below, there is only one graph for which Average velocity over the time interval (0, T) can vanish for a suitably chosen T. 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Explanation: If B represents time and A represents velocity then graph become (v-t). v-t graph is straight line so it is uniformly accelerated motion, so motion is not uniform. Verifies option (a), (d).. If B represents time and A represents displacement, then graph become (s-t) graph. Here s-t graph is straight line which represents uniform motion, so verifies the option (c). Question 11 For the graph below Match the column Solution. Graph (a) matches with (iii) has a point with zero displacement for t > 0 Reason:it is the only graph where x=0 Graph (b) matches with (ii) has x > 0 throughout and has a point with v = 0 and a point with a=0 Reason: x> 0 through and has a point with velocity v=0 i.e slope zero Graph (c) matches (iv) has v < 0 and a > 0. 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