

CLASS : XITH DATE :

**SUBJECT : PHYSICS DPP NO.:4** 

1. A constant power p is applied to a car starting from rest. If v is the velocity of the car at time t, then

d)  $v \propto \frac{1}{\sqrt{t}}$ b)  $v \propto \frac{1}{t}$ c)  $v \propto \sqrt{t}$ a)  $v \propto t$ 

2. A body of mass 3 kg is under a force which causes a displacement in it, given by  $s = t^2/3$  (in m). Find the work done by the force in 2 s J

a) 2 J	b) 3 <mark>.8 J</mark>	c) 5.2 J	d)2.6
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- 3. A bomb of mass 9 kg explodes into two parts. One part of mass 3 kg moves with velocity 16 m/s, then the KE of the other part is c) 192 I d)200 J a) 162 J b) 150 J
- 4. A spring gun of spring constant 90 *N/cm* is compressed 12 *cm* by a ball of mass 16 *g*. If the trigger is pulled, the velocity of the ball is c) 40 ms<sup>-1</sup> a) 50 ms<sup>-1</sup> b)9 ms<sup>-1</sup> d)90ms<sup>-1</sup>
- 5. A body is initially at rest. It undergoes one-dimensional motion with constant acceleration. The power delivered to it at time *t* is proportional to c)  $t^{3/2}$ a)  $t^{1/2}$ d) $t^2$ b)t
- 6. A shell initially at rest explodes into two pieces of equal mass, then the two pieces will a) Be at rest
  - b) Move with different velocities in different directions
  - c) Move with the same velocity in opposite directions
  - d) Move with the same velocity in same direction
- 7. The slope of the kinetic energy displacement curve of a particle in motion is
  - a) Equal to the acceleration of the particle b) Inversely proportional to the acceleration
  - c) Directly proportional to the acceleration d) None of the above

8.	From a building two balls $A$ to $B$ are thrown such that $A$ is thrown upwards and $B$ downwards (both vertically). If $v_A$ and $v_B$ are their respective velocities on reaching the ground, then			
	a) $v_B > v_A$	b) $v_B = v_A$		
	c) $v_A > v_B$	d) Their velocities depends on their masses		

- 9. A 50 g bullet moving with velocity 10 m/s strikes a block of mass 950 g at rest and gets embedded in it. The loss in kinetic energy will be
  a) 100% b) 95% c) 5% d) 50%
- 10. If the heart pushes 1 cc of blocked in one second under pressure 20000 N/m<sup>2</sup> the power of heart is
  a) 0.02 W
  b) 400 W
  c) 5 × 10<sup>-10</sup> W
  d) 0.2 W
- A ball is released from certain height. It loses 50% of its kinetic energy on striking the ground. It will attain a height again equal to
  - a) One fourth the initial height b) Hal

b)mgL

c) Three fourth initial height

b) Half the initial heightd) None of these

12. An object of mass *m* is tied to a string of length *L* and a variable horizontal force is applied on it which starts at zero and gradually increases until the string makes an angel  $\theta$  with the vertical. Work done by the force *F* is

a) 
$$mgL(1 - \sin\theta)$$

c)  $mgL(1 - \cos\theta)$ 

d)  $mgL(1 + \cos \theta)$ 

13. A light inextensible string that goes over a smooth fixed pulley as shown in the figure connects two blocks of masses 0.36 kg and 0.72 kg. Taking  $g = 10 m/s^2$ , find the work done (in joules) by the string on the block of mass 0.36 kg during the first second after the system is released from rest



14. A body of mass 2 kg moving with a velocity of 3 m/sec collides head on with a body of mass 1<br/>kg moving in opposite direction with a velocity of 4 m/sec. After collision, two bodies stick<br/>together and move with a common velocity which in m/sec is equal to<br/>a) 1/4b) 1/3c) 2/3d) 3/4

15.	A particle of mass $100g$ is thrown vertically upwards with a speed of $5m/s$ . The work done by the force of gravity during the time the particle goes up is						
	a) - 1.25 <i>J</i>	b) 1.25 <i>J</i>	c) 0.5 <i>J</i>	d) - 0.5 <i>J</i>			
16.	A neutron makes a head-on elastic collision with a stationary deuteron. The fractional energy loss of the neutron in the collision is						
	a) 16/81	b)8/9	c) 8/27	d)2/3			
17.	7. Which among the following, is a form of energy						
	a) Light	b)Pressure	c) Momentum	d)Power			
18.	3. A particle moves in a straight line with retardation proportional to its displacement. Its loss of KE for any displacement $x$ is proportional to						
	a) <i>x</i>	b) $x^2$	c) <i>x</i> <sup>0</sup>	d) $e^x$			
19.	. A smooth sphere of mass $M$ moving with velocity $u$ directly collides elastically with another						
	sphere of mass <i>m</i> at rest. After collision their final velocities are <i>V</i> and <i>v</i> respectively. The value						
	OF $\mathcal{V}$ IS $2uM$	2um	2u	2 <i>u</i>			
	a) $\frac{2mn}{m}$	b) $\frac{2MM}{M}$	C) $\frac{1+\frac{m}{M}}{1+\frac{m}{M}}$	d) $\frac{1}{1+\frac{M}{m}}$			
20.	A body of mass 2 kg is	thro <mark>wn up</mark> vertic <mark>ally w</mark> it	h kinetic energy of 490	J. The height at which the			
	kinetic energy of the body b <mark>ecom</mark> es hal <mark>f of it</mark> s ori <mark>ginal value is?</mark>						
	a) 50 m	b) 12.25 m	c) 25 m	d) 10 m			