

Practice paper term 1(2021-22)


Class xi

Marking Scheme

Physics

Section A		
Q. No.	Correct option	Hint/main points
1	b	
2	d	
3	b	
4	a	
5	d	
6	d	
7	a	
8	d	
9	b	
10	a	
11	b	
12	d	
13	a	<p>We have $\theta = 1^{\circ}54' = 114'$</p> $= (114 \times 60)'' \times (4.85 \times 10^{-6}) \text{ rad}$ $= 3.32 \times 10^{-2} \text{ rad,}$ $D = b / \theta$ $= \frac{1.276 \times 10^7}{3.32 \times 10^{-2}}$ $= 3.84 \times 10^8 \text{ m}$
14	d	<p>hint: use $S = ut + \frac{1}{2}at^2$</p> <p>$S = 25\text{m, } u = 0 \text{ m/s, } a = 2 \text{ m/s}^2 ; t = ?$</p> <p>On substituting above values and solving</p> <p>$t = 5\text{s}$</p>
15	c	
16	b	

17	a	<p>Maximum height $H = \frac{u^2 \sin^2 \theta}{2g}$</p> <p>$H = \frac{28^2 \times 0.5^2}{2 \times 9.8} = 10 \text{ m}$</p>
18	b	From Newton's Third Law an equal and opposite force acts on the road due to the cycle. It's magnitude is 200 N. However, the road undergoes no displacement. Thus, work done by cycle on the road is zero.
19	c	
20	c	
21	c	
22	b	
23	a	
24	c	
25	d	
		Section B
26	d	<p>explanation</p> <p>a. Kinetic energy is a scalar quantity but kinetic energy of a freely falling body is not conserved.</p> <p>b. Gravitational potential is a scalar quantity but its value is negative.</p> <p>c. Temperature is a scalar quantity but it varies from one point to other point in space.</p> <p>d. Scalar quantity is independent of orientation of Axis.</p>
27	c	
28	a	

29	c	
30	d	
31	d	
32	c	
33	b	
34	a	
35	b	
36	c	<p>Muzzle speed of the bullet is $V_B=150 \text{ m s}^{-1}=540 \text{ km h}^{-1}$</p> <p>Speed of the Police van is $V_V=30 \text{ km h}^{-1}$</p> <p>Resultant Speed of the bullet is $V=540+30=570 \text{ km h}^{-1}$</p> <p>Speed of the thief's car= $V_T=192 \text{ km h}^{-1}$</p> <p>The speed with which the bullet hits the thief's car=$V-V_T=570-192=378 \text{ km h}^{-1}=105 \text{ m s}^{-1}$</p>
37	d	
38	a	
39	c	
40	c	<p>Let mass of each body be m. Their motion is represented as shown in figure</p>  <p>From $\mathbf{v}_{CM} = \frac{m_1 \mathbf{v}_1 + m_2 \mathbf{v}_2}{m_1 + m_2}$</p> $\mathbf{v}_{CM} = \frac{m \times 2v - mv}{m + m} = \frac{v}{2}$ <p>[the direction of motion of first particle is taken as positive] So velocity of centre of mass of the system is $v/2$ in the direction of motion of particle having larger speed.</p>
41	d	

42	a	
43	a	The gravitational attraction of the sun provides the centripetal force to keep the earth in stable orbit around the earth.
44	c	$m = F/a = 10/1 = 10\text{kg}$
45	a	Wetting of roads lowers the coefficient of friction between the tyres and the road.
46	c	Impulse and momentum both have same unit (N-s). Impulse and momentum are different quantities
47	d	A cricket player moves his hands backward to increase the time interval for reducing the momentum of the ball to zero. Thus the ball does not hit him hard as force is directly proportional to change of momentum.
48	a	Friction causes wear & tear and loss of energy, so it is an evil but without friction walking, stopping a vehicle etc. would not be possible. So it is necessary for us.
49	d	Horizontal component of normal reaction provides the necessary centripetal force. Centripetal force is also required for turning.
50	d	
51	c	$M = 10\text{kg}$, $r = 0.20\text{m}$, $f = 1000/60 \text{ s}^{-1}$ angular speed $= 2\pi f = 2\pi \times 1000/60 = 100\pi/3 \text{ rads}^{-1}$

		$\text{linear velocity} = r \omega = 0.20$ $\times 100 \pi / 3 = 20 \pi / 3 \text{ ms}^{-1}$
52	b	
53	c	
54	c	$W = \mathbf{F} \cdot \mathbf{s}$ $= (i^{\wedge} + 5j^{\wedge} + 7k^{\wedge}) \cdot (6i^{\wedge} + 0j^{\wedge} + 9k^{\wedge})$ $= 69\text{J}$
55	c	$\mathbf{F} \cdot \mathbf{s} = F s \cos \theta.$ $= F s \cos 90^{\circ} = \text{zero}$