## Single Correct Answer Type

1.	A ball rolls of the top of high and 0.20 m wide. V	stair-way with a horizon /hich step will the ball h	ntal velocity of magnitude 1.8 it first?	ms <sup>-1</sup> . The steps are 0.20 m	
	a) First	b) Second	c) Third	d) Fourth	
2.	A stone of mass 1 kg tie	d to a light inextensible	string of length $L = \frac{10}{3}$ is whir	ling in a circular path of	
	radius <i>L</i> in vertical plane. If the ratio of the maximum tension to the minimum tension in the string is 4. What is the speed of stone at the highest point of the circle? (Taking $g = 10 \text{ms}^{-2}$ )				
	a) 10 ms <sup>-1</sup>	b) 5√2 ms <sup>−1</sup>	c) $10\sqrt{3} \text{ ms}^{-1}$	d) 20 ms <sup>-1</sup>	
3.	When a projectile is projected at a certain angle with the horizontal, its horizontal range is $R$ and time of flight is $T_1$ . When the same projectile is throwing with the same speed at some other angle with the horizontal its horizontal range is $R$ and time of flight is $T_2$ . The product of $T_1$ and $T_2$ is				
	R	2R	3R	$\frac{4R}{2}$	
	a) — g	b) <u>g</u>	c) <u> </u>	u) <u> </u>	
4.	If a person can throw a through which it can be	he maximum distance			
	a) $\frac{h}{2}$	b) <i>h</i>	c) 2 <i>h</i>	d) 3 <i>h</i>	
5.	The angle of projection a) 45°	at which the horizontal	range and maximum height of b) $\theta = \tan^{-1}(0.25)$	f projectile are equal is	
	c) $\theta = \tan^{-1} 4$ or $(\theta = 2)$	<sup>7</sup> 6°)	d) 60°		
6.	Two projectile are throw	vn with the same initial	velocity at angles $\alpha$ and (90°	$-\alpha$ ) with the horizontal. The	
	maximum heights attair	red by them are $h_1$ and $h_2$	$h_2$ respectively. Then $\frac{h_1}{h_2}$ is equ	al to	
	a) $\sin^2 \alpha$	b) $\cos^2 \alpha$	c) $\tan^2 \alpha$	d) 1	
7.	A small particle of mass	<i>m</i> is projected at an ang	gle $ heta$ with the $x$ -axis with an in	nitial velocity $v_0$ in the x-y	
	plane as shown in the fi	gure. At a time $t < \frac{v_0 \sin x}{a}$	$\frac{\theta}{2}$ , the angular momentum of t	he particle is	
	y V <sub>0</sub>	►X	1	1	
	a) $-mgv_0t^2\cos\theta\hat{\mathbf{j}}$	b) $mgv_0t\cos heta {f \hat k}$	c) $-\frac{1}{2}mgv_0t^2\cos\theta\hat{\mathbf{k}}$	d) $\frac{1}{2}mgv_0t^2\cos\theta \hat{\mathbf{i}}$	
8.	A body is thrown upware velocity 3 $m/s$ . Both following 2 $m/s^2$	rd from the earth surfact ow the same path. What b) $2.5 \text{ m} (r^2)$	e with velocity 5 $m/s$ and from t is the projectile acceleration	n a planet surface with due to gravity on the planet $d_{1}$ for $(a^{2})$	
0	a) $2 m/s^{-1}$	DJ 3.5 $m/s^2$	C) $4 m/S^{-}$	$a_{J} 5 m/s^{-}$	
9.	wheels respectively, then $R_1 = R_2$ wheels respectively.				
10	a) $R_1 = R_2$	$K_1 < K_2$	$CJ K_1 > K_2$	$\begin{array}{c} \text{(I)} R_1 \geq R_2 \\ \text{(I)} R_1 = R_2 \\ \text{(I)} R_2 = R_2 \\ \text{(I)} R_1 = R_2 \\ \text{(I)} R_2 = R_2 \\ \text{(I)} R_1 = R_2 \\ \text{(I)} R_2 = R_2 \\ \text{(I)}$	
10.	A particle does uniform	circular motion in a hor	rizontal plane. The radius of th	ie circle is 20 cm. The	
	a) 0.1 <i>I</i>	h) $0.2 I$	c) 201	d) 1 0 <i>I</i>	
11.	A projectile is thrown at	$\beta$ angle $\beta$ with vertical. It	reaches a maximum height <i>H</i>	The time taken to reach the	

highest point of its path is

	a) $\frac{H}{H}$	h) $\frac{2H}{2H}$	c) $\frac{H}{H}$	d) $2H$	
	, g	∫ g	$\sqrt{2g}$	$\sqrt{g}\cos\beta$	
12.	The resultant of two vectors $\vec{A}$ and $\vec{B}$ is perpendicular to the vector $\vec{A}$ and its magnitude is equal to half of				
	the magnitude of vector	$\vec{B}$ . Then the angle between $\vec{A}$	$\vec{A}$ and $\vec{B}$ is		
	a) 30°	b) 45°	c) 150°	d) 120°	
13.	$(\vec{P} + \vec{Q})$ is a unit vector a	long <i>X</i> -axis. If $\vec{P} = \hat{i} - \hat{j} + \hat{l}$	$\hat{k}$ , then what value is $\vec{Q}$ ?		
	a) î + ĵ — k	b) $\hat{j} - \hat{k}$	c) $\hat{i} + \hat{j} + \hat{k}$	d) ĵ + k	
14.	For a projection, (range)	<sup>2</sup> is 48 times of (maximum	height) <sup>2</sup> obtained. Find ang	gle projection.	
4 5	a) 60°	b) 30°	c) 45° ⇒	d) 75°	
15.	The area of parallelogram	n formed from the vectors .	$A = \hat{i} - 2\hat{j} + 3k \text{ and } B = 3\hat{i}$	$-2\hat{j} + k$ as adjacent sides is	
	a) $8\sqrt{3}$ units	b) 64 units	c) 32 units	d) $4\sqrt{6}$ units	
16.	What happens to the cen is halved?	tripetal acceleration of a pa	article, when its speed is do	ubled and angular velocity	
	a) Doubled		b) Halved		
	c) Remains unchanged		d) Becomes 4 times		
17.	An object is projected so object is <i>H</i> , then the ratio	that its horizontal range $R$ o of $R/H$ is	is maximum. If the maximu	im height attained by the	
	a) 4	$b)\frac{1}{-}$	c) 2	$d)\frac{1}{2}$	
10	A mighton on throw of	4 all to a maximum havinant	al diatan as of 100 m. The ar	<sup>2</sup> 2	
18.	A cricketer can throw a ball to a maximum horizontal distance of $100 \text{ m}$ . The speed with which he throw the ball is (to the nearest integer)				
	a) 30 ms <sup>-1</sup>	b) 42 ms <sup>-1</sup>	c) 32 ms <sup>-1</sup>	d) 35 ms <sup>-1</sup>	
19.	A particle undergoes uni	form circular motion. Abou	t which point on the plane	of the circle, will the	
	angular momentum of th	e particle remain conserve	d?		
	a) center of the circle		b) on the circumference of	of the circle	
20	c) inside the circle	of a force are 2 N and 2N	d) outside the circle		
20.	a) $2\hat{i} = 3\hat{i}$	b) $2\hat{i} + 3\hat{i}$	$(1) - 2\hat{i} - 3\hat{i}$	d) 3î + 2î	
21.	As per given future to co	mplete the circular loop wh	at should be the radius if ir	nitial height is $5 m$	
- 11	T				
	h=5 m				
22	a) $4m$	b) $3m$	c) 2.5 m $-1$ at an angle of 600 with t	d) $2m$	
22.	A body of mass 1 kg thro	wh with a velocity of 10 ms	s - at an angle of 60° with t	ne norizontal. Its	
	a) $2 \text{ kg ms}^{-1}$	b) $3 \text{ kg ms}^{-1}$	c) 4 kg ms <sup>-1</sup>	d) 5 kg ms <sup>-1</sup>	
23	A ball is projected with y	velocity $u$ at an angle $\alpha$ with	horizontal plane. Its speed	when it makes an angle ß	
201	with the horizontal is				
		$\frac{u}{1}$		$\frac{u\cos\alpha}{1}$	
		$^{\rm DJ}\cos\beta$		$\cos \beta$	
24.	A curved road of 50 m radius is banked at correct angle for a given speed. If the speed is to be doubled				
	keeping the same bankir	ig angle, the radius of curva	ture of the road should be o	changed to	
25	aj 25 m	bJ 100 m	cJ 150 m	aj 200 m	
		······································		and the shear of the state of t	
25.	A wheel rotates with a co	onstant angular velocity of 3	300 rpm. The angle through	n which the wheel rotates in	

26.	An object of mass 5 kg is whirled round in a vertical circle of radius 2 m with a constant speed of 6 ms <sup>-1</sup> .				
	The maximum tension in the string is				
	a) 152 N	b) 139 N	c) 121 N	d) 103 N	
27.	A car wheel is rotated to uniform angular acceleration about its axis. Initially its angular velocity is zero. It rotates through an angle $\theta_1$ in the first 2 s, in the next 2 s, it rotates through an additional angle $\theta_2$ , the				
	ratio of $\frac{\theta_2}{\theta_1}$ is				
	a) 1	b) 2	c) 3	d) 5	
28.	What is the angle betw	ween $\hat{i} + \hat{j} + \hat{k}$ and $\hat{i}$			
	a) 0°	b) π/6	c) π/3	d) None of these	
29.	A body moves along a circular path of radius 10 m and the coefficient of friction is 0.5. What should be its angular speed in rad s <sup>-1</sup> , if it is not to slip from the surface? ( $g = 9.8 \text{ ms}^{-2}$ )				
	a) 5	b) 10	c) 0.1	d) 0.7	
30.	An object is projected reached will be in the	l at an angle of 45° with ratio	h the horizontal. The horizon	tal range and maximum height	
	a) 1:2	b) 2:1	c) 1:4	d) 4:1	
31.	A body is projected with speed $v \text{ ms}^{-1}$ at angle $\theta$ . The kinetic energy at the highest point is half of the initial kinetic energy. The value of $\theta$ is				
	a) 30°	b) 45°	c) 60°	d) 90°	
32.	The range of particle when launched at an angle $15^{\circ}$ with the horizontal is 1.5 km. What is the range of projectile when launched at an angle of $45^{\circ}$ to the horizontal?				
	a) 3.0 km	b) 1.5 km	c) 6.0 km	d) 0.75 km	
33.	A car of mass 1000 kg	g negotiates a banked c	urve of radius 90 <i>m</i> on a frict	tionless road. If the banking angle	
	$1545^\circ$ , the speed of th	e car is	. <b>-</b> −1	12 4 0 -1	
24	a) 20ms	b) $30ms^{-1}$	c) $5ms^{-1}$	d) 10ms -	
34.	what is the unit vector $\hat{1} \perp \hat{1}$	or along $1 + j$ ?			
	a) $\frac{1+1}{\sqrt{2}}$	b) $\sqrt{2}(\hat{i} + \hat{j})$	c) î + ĵ	d) ƙ	
35.	A particle moves in a circle of radius 5 $cm$ with constant speed and time period 0.2 $\pi s$ . The acceleration of the particle is				
	a) $5 m/s^2$	b) 15 <i>m/s</i> <sup>2</sup>	c) 25 m/s <sup>2</sup>	d) $36 m/s^2$	
36.	The maximum range of a gun on horizontal terrain is 16 km. If $g = 10 m/s^2$ . What must be the muzzle velocity of the shell				
	a) 200 <i>m/s</i>	b) 400 <i>m/s</i>	c) 100 m/s	d) 50 <i>m/s</i>	
37.	Three vectors $\vec{A}$ , $\vec{B}$ and $\vec{C}$ satisfy the relation $\vec{A} \cdot \vec{B} = 0$ and $\vec{A} \cdot \vec{C} = 0$ . If $\vec{B}$ and $\vec{C}$ are not lying in the same				
	plane then $\vec{A}$ is parallel to				
	a) ₿	b) <b>Č</b>	c) $\vec{B} \times \vec{C}$	d) $\vec{B} \cdot \vec{C}$	
38.	Two cars of masses $m_1$ and $m_2$ are moving in circles of radii $r_1$ and $r_2$ respectively. Their speeds are such that they make complete circles in the same time $t$ . The ratio of their centripetal acceleration is				
	a) $m_1 r_1 : m_2 r_2$	b) $m_1: m_2$	c) <i>r</i> <sub>1</sub> : <i>r</i> <sub>2</sub>	d) 1 : 1	
39.	Two particles are projected simultaneously in the same vertical plane, from the same point, both with different speeds and at different angles with horizontal. The path followed by one, as seed by the other, is a) A vertical line				
	b) A parabola				
	c) A hyperbola				

d) A straight line making a constant angle ( $\neq$  90°) with the horizontal

40. The simple sum of two co-initial vectors is 10 units. Their vector s				. The resultant of the	
	vectors is perpendicular	to the smaller vector. The r	nagnitudes of the two vecto	ors are	
	a) 2 units and 14 units				
	b) 4 units and 12 units $a$				
	d) Quints and Quints				
11					
41.	The resultant of two forc	es at right angle is 5N. Whe	in the angle between them	is $120^\circ$ , the resultant is $\sqrt{13}$ .	
	I nen the force are	$h$ $\sqrt{20}$ $M$ $\sqrt{5}$ $M$	c) 2 N <i>A</i> N	$d$ $\sqrt{40}$ M $\sqrt{45}$ M	
40	a) $\sqrt{12N}$ , $\sqrt{13N}$	DJ $\sqrt{20}$ N, $\sqrt{5}$ N	CJ J N, 4 N	$(1) \sqrt{40}$ N, $\sqrt{15}$ N	
42.	I WO DOULES OF MASS TO K	g and 5 kg moving in conce	nuric orbits of radii R and r	such that their periods are	
	the same. I nen the ratio	between their centripetal a	cceleration is $D^2/w^2$	d)2 / D2	
12	a) $K/T$	UJT/K	C) $K^{-}/T^{-}$	$u_{J}r^{-}/R^{-}$	
45.	3. A body is projected horizontally with speed 20 ms <sup>-1</sup> . The approximate displacement of the body after				
	a) 80 m	b) 120 m	c) 160 m	d) 320 m	
44.	A particle moves along a	circle of radius $\left(\frac{20}{\pi}\right)$ m with	n constant tangential accele	ration. If the velocity of the	
	particle is 80 ms <sup>-1</sup> , at the end of seconds revolution after motion has begun, the tangential acceleration			e tangential acceleration is	
	a) $40 \text{ ms}^{-2}$	b) 640 $\pi$ ms <sup>-2</sup>	c) 1609 $\pi$ ms <sup>-2</sup>	d) $40 \pi \mathrm{ms}^{-2}$	
45.	A projectile is thrown at	angle $\beta$ with vertical. It read	ches a maximum height <i>H</i> .'	The time taken to reach the	
	highest point of its path i	S			
	Н	2.H	Н	Н	
	a) $\left \frac{a}{a}\right $	b) $\left \frac{a}{a}\right $	c) $\left \frac{1}{2a}\right $	d) $\frac{1}{a\cos\beta}$	
10	$\sqrt{9}$	الا ب الم	$\sqrt{-9}$		
40.	An object of mass 10 kg is	s whilled round a horizond	al circle of radius 4 m by a f t is $\Gamma$ ms <sup>-1</sup> the tension in t	revolving string inclined	
	$_{2}$ $_{2}$ $_{2}$ $_{2}$ $_{2}$ $_{2}$ $_{3}$ $_{2}$ $_{2}$ $_{3}$ $_{2}$ $_{3}$ $_{2}$ $_{3}$ $_{2}$ $_{3}$ $_{3}$ $_{2}$ $_{3}$	b) of N	c) 114 N	d) 125 N	
47	A body grosses the term	UJ 900 N	U 114 N	uj 125 N	
47.	47. A body crosses the topmost point of a vertical circle with critical speed. What will be its accelerate the string is herizontal?			viii be its acceleration when	
	a) σ	h) 2 σ	c) 3 a	d) 6 a	
48	The magnitude of the V a	$\overrightarrow{V}$	7 and 6 Also the magnitude	ujog	
The magnitude of the X and Y components of A are 7 and 6. Also the magnitudes of X and Y components $\vec{x} = \vec{x}$			es of A and F components of		
	A + B are 11 and 9 respenses	ctively. What is the magniti	ade of B?	10	
40	a) 5	DJ O d 20 m (as a sin a sin and an a		a) 9	
49.	A car is moving with speed 50 $m/sec$ on a circular path of radius 500 $m$ . Its speed is increasing at the rate of $2m/sac^2$ . What is the acceleration of the car				
	of $2m/\sec^2$ , what is the	acceleration of the car $b = 2.7m/\cos^2$	a) $1.0m/aaa^2$	d) $0.0m/aaa^2$	
го	a) $2m/\sec^2$	DJ 2./m/ sec-	$C_{J} = 1.8m/sec^{-1}$	U) 9.8m/ sec <sup>-</sup>	
50.	A car is moving on a circular level road of radius of curvature 300 m. If the coefficient of friction is 0.3 and $\frac{1}{10}$				
	acceleration due to gravi	h) 81		d) 162	
	a) <i>T</i> .	b) $T_{\rm c}/2$	c) $4T_{-}$	d) 87.	
	c) $x = 3y^2 + 5$	5J 10/2	d) Can not be found from	above data	
	$c_j x - b_j + b$		aj can not de lound nom	above uata	