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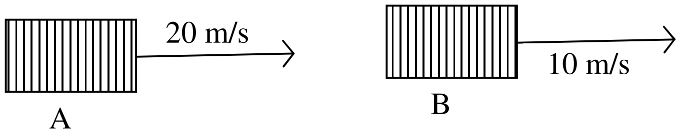

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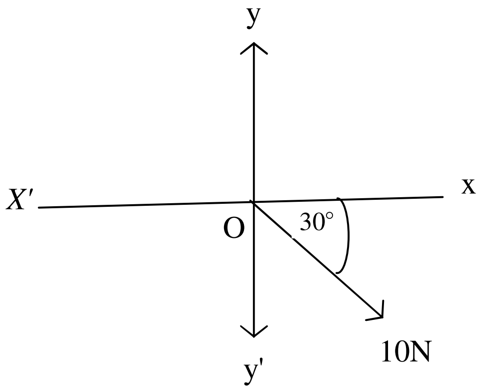

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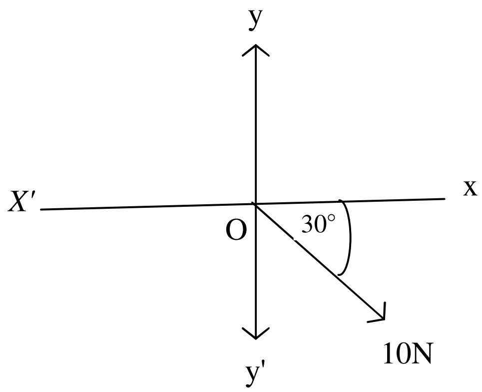

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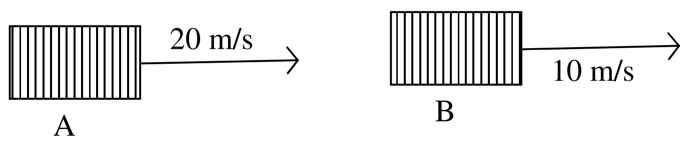

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6. The differential eq. of central orbit in polar form is $\frac{d^2u}{d\theta^2}+u=\frac{F}{h^2u^2}$; where $u = \frac{1}{r}$; using given differential eq., the law of force (F) for the differential equation $\frac{d^2u}{d\theta^2}+u=5a^8u^9$ is :

(1) $F \, \alpha \frac{1}{r^{11}}$

(2) $F \, \alpha \, r^{11}$

(3) $F = \frac{1}{r^{21}}$

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7. The law of force for the differential equation $\frac{d^2u}{d\theta^2}+u=8a^2u^3$, is :

(1) Force varies inversely as the 5th power of the distance from the pole.

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(3) Force is 9th power of the distance from the pole

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8. Gravitational force which acts on 1 kg is :

(1) 980 N (2) $\frac{1}{9.8}N$

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(1) 3 : 1 (2) 1 : 3

(3) 1000 : 1 (4) None of these

10. 1 hp is equal to :

(1) 7.46 kw (2) 74.6 kw

(3) 0.746 kw (4) 746 kw

11. In tug of war (To pull a rope by two opponent teams), work done by winning team is :

(1) Zero (2) Positive

(3) Negative (4) None of these

12. Two bodies A and B of mass M and 2 M respectively, having same momentum, Then the ratio of velocity $(V_A : V_B)$ is :

(1) 1 : 2 (2) 2 : 1

(3) 1 : 1 (4) 3 : 2

13. The combined effect of mass and velocity is taken into account by a physical quantity called :

(1) Torque (2) Moment of force

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14. The horizontal range of a particle is two times of its greatest height. The angle of projection (α) is :

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15. A stone is rotated in a circle with a string. The string suddenly breaks. In which direction will the stone move ?

(1) The stone will move along the radius towards the centre

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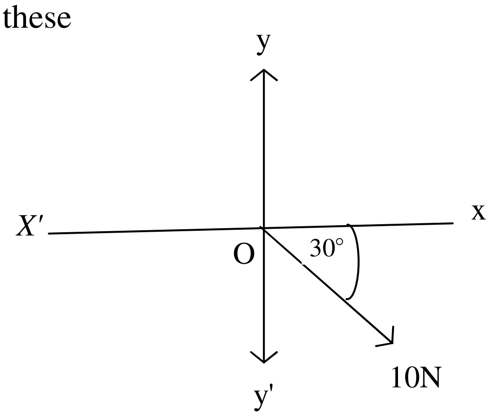

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Find the horizontal and vertical component of force respectively in given figure :

(1) $5\sqrt{3}\,\hat{i},\ -5\hat{j}$ (2) $-5\sqrt{3}\,\hat{i},\ 5\hat{j}$

(3) $5\sqrt{3}\,\hat{i},\ 5\hat{j}$ (4) $-5\sqrt{3}\,\hat{i},\ -5\hat{j}$

18. Javelin is thrown at an angle θ with the horizontal and the range is maximum. The value of tan θ is :

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

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19. When a body is stationary :

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(1) $\frac{d^2r}{dt^2} - r\left(\frac{d\theta}{dt}\right)^2$

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21. When a particle is moving with uniform speed u, then resultant acceleration of the particle is :

(1) Tangential acceleration only

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(1) Watt (2) One Joule/sec

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29. Car A has twice the mass of car B, but both have the same kinetic energy $\left(K.E. = \frac{1}{2}mv^2\right)$. How do their speeds compare ?

(1) $2v_1 = v_2$ (2) $\sqrt{2}v_1 = v_2$

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30. A stone released with zero velocity from the top of a tower reaches the ground in 4 seconds. The height of the tower is about : [Take g = 10 m/s^2]

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(1) radian/sec

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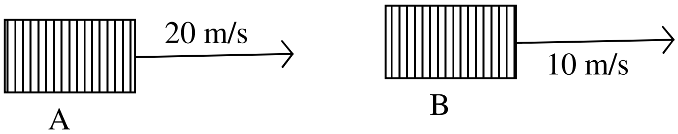

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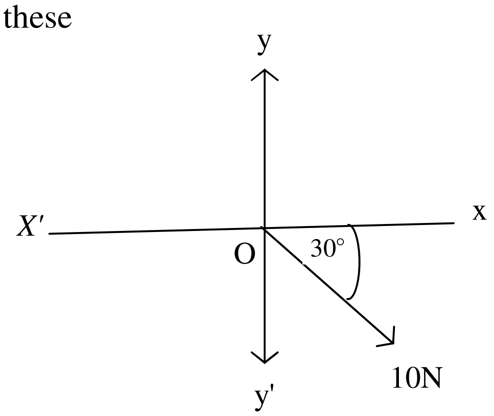

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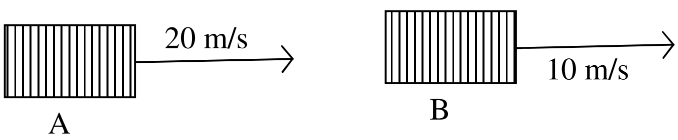

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(1) $\frac{5}{18}$ (2) $\frac{18}{5}$

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41. Absolute unit of force in C.G.S. system is :

(1) Newton

(2) Dyne

(3) Poundal

(4) None of these

42. Velocity in terms of its tangential and normal components (through vector approach) is :

(1) $\frac{ds}{dt}\hat{t} + 0\hat{x}$

(2) $\frac{dv}{dt}\hat{t} + \frac{v^2}{\rho}\hat{x}$

(3) $\frac{d^2s}{dt^2}\hat{t} + \frac{v^2}{\rho}\hat{x}$

(4) None of these

43. A football is picked into air vertically upwards. What is its velocity and acceleration at the highest point ?

(1) Zero, g

(2) Zero, – g

(3) Given information is insufficient

(4) None of these

44. Focus of the trajectory of a projectile motion is :

(1) $\left(\frac{u^2 \sin 2\alpha}{2g}, \frac{u^2 \sin^2 \alpha}{2g}\right)$

(2) $\left(\frac{u^2 \sin 2\alpha}{2g}, \frac{u^2 \cos^2 \alpha}{2g}\right)$

(3) $\left(\frac{u^2 \sin 2\alpha}{2g}, \frac{-u^2 \cos\ 2\alpha}{2g}\right)$

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45. Least velocity of projection for a particle to hit a given point (h, k) is given by :

(1) $u^2 = g\left[k + \sqrt{h^2 + k^2}\right]$

(2) $u^2 > g\left[k + \sqrt{h^2 + k^2}\right]$

(3) $u^2 < g\left[k + \sqrt{h^2 + k^2}\right]$

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Revised

60580 Code – A

Subject Dynamics Set ____

ANSWER – KEY

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21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
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41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
2	1	3	3	4	2	4	1	2	1

(Signature of the Paper-Setter)

Prepared on the basis of Photocopy of ABCD Key Prepared by the Examiner

5/11/20

5/11/20

Revised

60580 Code - B

Subject Dynamics **Set** —

ANSWER – KEY

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2	2	3	2	3	1	1	3	3	3
31	32	33	34	35	36	37	38	39	40
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41	42	43	44	45	46	47	48	49	50
1	2	3	4	4	2	3	2	3	1

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15/11/20

5/11/20

Revised

60580 Code - C

Subject Dynamics Set —

ANSWER – KEY

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5/11/20

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Revised

60580 Code-D

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1	2	3	4	5	6	7	8	9	10
2	2	3	2	3	1	1	3	3	3
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
2	1	3	3	4	2	4	1	2	1
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
1	2	3	4	4	2	3	2	3	1
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
2	3	4	1	2	1	2	2	4	1
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
2	1	2	3	1	1	1	3	3	3

(Signature of the Paper-Setter)

15/11/20

5/11/20