[:NQ]

[Q:1]A light spring of force constant 1 N/cm is stretched between two fixed supports ‘A’ and ‘B’. A point P on the spring is pulled parallel to the spring towards the support ‘B’ by a gradually increasing force. When this force becomes 5N, what is magnitude of displacement of the point ‘P’?



[:A] 8 mm

[:B] 22.2 mm

[:C] 40 mm

[:D] Relaxed length of spring is required

[:ANS] A

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

|  |  |
| --- | --- |
| [:Q:2] In the setup shown, the pulleys, the cords and the spring are ideal and masses of loads are indicated in figure. Initially system is in equilibrium. What should be range of ‘M’ so that acceleration of load of mass 2m becomes greater than acceleration of free fall immediately after the cord is cut at point ‘p’?[:A] M > 4m[:B] M > 6m[:C] M > 8m[:D] M > 14m[:ANS] B[:SOL] NA[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN[:NQ] |  |

|  |  |
| --- | --- |
| [:Q:3] A block is suspended from a uniform rope that passes through two ideal pulleys. The other end of the rope is tied to a fixed support as shown in the figure. If pulleys are pulled vertically with force F1 = 110 and F2 = 90 N, the system stays at rest. Assuming linear mass density of the rope 0.25 kg/m and acceleration of free fall 10 m/s2, Find the length of the rope. Pulleys are not small (g = 10 m/s2) [:A] 4m[:B] 6m[:C] 8m[:D] Insufficient information[:ANS] C[:SOL] NA[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN[:NQ] |  |

[:Q:4] In the arrangement shown the springs are light and have stiffness K1 = 100 N/m and K2 = 200 N/m and pulleys are ideal. An 8 kg block suspended from lower pulley is initially held at rest maintaining the strings straight and springs relaxed. Now the force supporting the block is gradually reduced to zero. How far does the block descend during the process of reduction of the force? Acceleration due to gravity is 10m/s2



 [:A] 10 cm

 [:B] 15 cm

 [:C] 16 cm

 [:D] None of these

[:ANS] B

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

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| --- | --- |
| [:Q:5] A small block is sliding on a frictionless inclined plane that is moving upward with a constant acceleration. If the block remains at a level height, what is the acceleration of the inclined plane? Acceleration due to gravity is g. |  |

 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] D

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:6] In the setup shown, blocks of masses 3m and 2m are placed on a frictionless horizontal ground and free end P of the thread is being pulled by a constant force F. Find acceleration of free end P.



 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] D

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:7] Under simultaneous action of two forces, a stationary particle starts moving parallel to a vector  If one of the force is  N and the other has smallest possible magnitude. Find out other force?

 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

|  |  |
| --- | --- |
| [:Q:8] The two blocks, m = 10 kg and M = 50 kg are free to move as shown. The coefficient of static friction between blocks is 0.5 and there is no friction between M and the ground. A minimum horizontal force F is applied to hold m against ‘M’ that is equal to (g = 10m/s2). |  |

 [:A] 100 N

 [:B] 50 N

 [:C] 240 N

 [:D] 180 N

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:9] From a solid sphere of mass M and radius R, a cube of maximum possible volume is cut. The moment of inertia of cube about on axis passing through its centre and perpendicular to one of its faces is

 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

|  |  |
| --- | --- |
| [:Q:10] A solid cone of height H and base radius  floats in a liquid of density . It is hanging from the support with the help of string. The force by the fluid on the curved surface of the cone is. [:A]  [:B]   [:C]  [:D] [:ANS] B[:SOL] NA[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN[:NQ] |  |

[:Q:11] A frictionless rod ABC and a particle P of mass m are lying on a frictionless, horizontal floor as shown in top view of the situation. The portion AB of the rod is bent to form a quarter of circle. The rod is suddenly made to move with a constant velocity ‘v’ towards right along portion BC. What is work done by rod on the particle till it leaves the rod?



 [:A] 

 [:B] 

 [:C] 

 [:D] None of these

[:ANS] B

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:12] Potential energy function is shown in graph. A particle moving in this potential field in the positive x-direction, if possesses 1J of kinetic energy at x = 1m, where will it reverse its direction of motion?

 [:A] x = 1m

 [:B] x = 2m

 [:C] x = 5m

 [:D] x = 6m

[:ANS] D

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

|  |  |
| --- | --- |
| [:Q:13] A small disc placed on a frictionless horizontal floor is attached at one end of a light inextensible cord, the other end of which is attached on a vertical cylinder fixed on the floor. The disc is projected with a certain velocity perpendicular to the cord and along the floor. How will the tensile force in the cord and speed of the disc change during the ensuing motion. |  |

 [:A] Both will increase

 [:B] Both will remain constant

 [:C] Tensile force will increase and speed will decrease

 [:D] Tensile force will increase and speed will remain constant.

[:ANS] D

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:14] A light rod of length L is suspended from a support horizontally by means of two vertical wire A & B of equal length as shown. Cross-section area of A is half that of B, and young’s modulus of A is double than that of B. A weight W is hung on the rod as shown. The value of x so that the stress in A is same as that in B is –



 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:15] The kinetic energy acquired by a mass ‘m’ in travelling a certain distance d, starting from rest, under the action of a force F such that F is directly proportional to ‘t’ is

 [:A] directly proportional to t2

 [:B] independent of t

 [:C] directly proportional to t4

[:D] directly proportional to t

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:16] A particle A of mass  is moving in the positive direction of x. Its initial position is x = 0 and initial velocity is 1 m/s. The velocity at x = 10 is



 [:A] 4 m/s

 [:B] 2 m/s

 [:C] 

 [:D] 

[:ANS] A

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:17] A man places a chain of mass m and length L on a table slowly. Initially the lower end of the chain just touches the table. The man drops the chain when half of the chain is in vertical position. The work done by the man in this process is

 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:18] A block is lying on a smooth surface with spring connected to it is pulled by an external force as shown. Initially the velocity of ends A and B of spring are 4 m/s and 2 m/s respectively. If the energy of the spring is increasing at the rate of 20 J/sec then stretch in the spring is



 [:A] 1 cm

 [:B] 2 cm

 [:C] 10 cm

 [:D] 2 cm

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:19] A bead of mass m is sliding down a fixed inclined rod without friction. It is connected to point P on a horizontal surface with a light spring of spring constant K. The bead is initially released from rest and the spring is initially unstretched and vertical. The bead just stops at bottom of inclined rod. Find the angle which the inclined rod makes with horizontal.



 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] A

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:20] A particle moves in a plane along an elliptic both given by  At point (0, b) x-component of velocity is u. The y-component of acceleration at this point is

 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] A

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:21] A simple pendulum is released from rest at the horizontally stretched position. When string makes an angle  with the vertical the angle  which acceleration vector of bob makes with string is given by

 [:A] 

 [:B] 

 [:C] 

 [:D] 

[:ANS] B

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:23] A plank is resting on a horizontal ground in the northern hemisphere of the earth at a 45° latitude. Let the angular speed of earth be w and radius re. The magnitude of the frictional force on the plank will be.

 [:A] 

 [:B] 

 [:C] 

 [:D] zero

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

|  |  |
| --- | --- |
| [:Q:24] Two bikers simultaneously start a race with constant speeds from point A to traverse a triangular track. ABC, one clockwise and other in anticlockwise sense. They simultaneously cross at B first time after a time interval  If they continue the race, how long after they cross at B first time will they again simultaneously cross at B. |  |

 [:A] 60 min

 [:B] 72 min

 [:C] 48 min

 [:D] 16 min

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

|  |  |
| --- | --- |
| [:Q:25] Four identical rod each of mass M and length L are placed on one another on the table so as the produce the maximum overhang as shown in figure. The maximum total overhang will be.  [:A]  [:B]  [:C]  [:D] [:ANS] C[:SOL] NA[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN[:NQ] |  |

|  |  |
| --- | --- |
| [:Q:26] A slender but rigid semi-circular wire of radius r is supplied on its vertical plane by a hinge at O and a smooth peg A. If peg starts from O and moves with constant speed u0 along the horizontal, Find angular velocity w of the wire at the instant  [:A]  [:B]  [:C]  [:D] [:ANS] B[:SOL] NA[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN[:NQ] |  |

|  |  |
| --- | --- |
| [:Q:27] A particle P is projected from a point on surface of smooth inclined plane (see figure). Simultaneously another particle Q is released on smooth incline plane from same position. P and Q collide on incline plane after  The speed of projection of P is |  |

 [:A] 

 [:B] 10 m/s

 [:C] 15 m/s

 [:D] 20 m/s

[:ANS] B

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

|  |  |
| --- | --- |
| [:Q:28] For an observer on the trolley direction of projection of particle shown in figure, while for observer on ground ball rise vertically. The maximum height reached by ball from trolley is |  |

 [:A] 10 m

 [:B] 15 m

 [:C] 20 m

 [:D] 5m

[:ANS] B

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

|  |  |
| --- | --- |
| [:Q:29] AB is an inclined plane of inclination 30° with horizontal. Point O is 20m above point A. A particle is projected horizontally and it collides with the plane AB perpendicularly. Speed of particle must be (g = 10 m/s2) |  |

 [:A] 13 m/s

 [:B] 

 [:C] 

 [:D] 

[:ANS] C

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:NQ]

[:Q:30] Two particles A and B starts from same point and move in positive x-direction. In a time interval of 2 sec after they start, their velocities ‘v’ vary with time ‘t’ as shown in figure. What is maximum separation between particles during this time interval.



 [:A] 1m

 [:B] 1.25 m

 [:C] 1.5m

 [:D] 2.0m

[:ANS] B

[:SOL] NA

[:INFO] mp=4, mn=1, type=MCQ, course =5bc6137d1796004a5da20051, subject = PHYSICS, level= 3, dlang=EN

[:END]