8. A box of mass 40Kg more is pulled for a distance of 5m along a horizontal floor with a constant horizontal force 140N. The kinetic coefficient of friction between the box and the floor is 0.3. The work done by the applied force is

a. 300J b. 500J c. 700J d. 900J e. none of the above

9. In question 7 the work done by the friction force is

a. -600J b. -500J c. 600J d. 500J e. none of the above

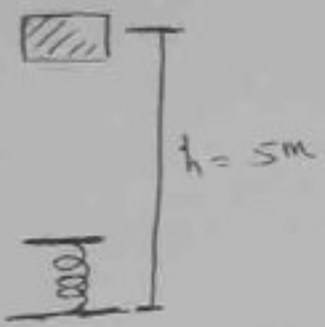
10. the position of the particle is given by an expression $r = 5.6t\,i + (4.2t - 4.9t^2)\,j$. The velocity of the object after is given by expression

a. $v = 4.6i + (4 - 4.9t)\,j$ m/s b. $v = 5.6i + (4.2 - 9.8t)\,j$ m/s c. $v = 5.6i + (7.2 - 9.8t)\,j$ m/s

d. $v = 3.6i + (2.2 - 9.8t)\,j$ m/s e. none of the above

III. For the following questions show your works clearly

1. An object of mass 10Kg falls as shown in the figure. Find the amount of the compression of the spring if the sprig constant is 2000N/m (take $g = 10\,m/s^2$)



If the statement is correct write TRUE, if the statement is incorrect write FALSE

1. True Time, speed and energy are scalar quantities
2. True There is a possibility for an object with a zero velocity to have an acceleration
3. False Scientifically a person carrying a load on his head and moving on a level horizontal surface does a work
4. True The maximum range of a projectile is obtained when the object is projected at 45°
5. True An object suspended by a rope in air could not experience a normal force
6. _____ For a car turning around a curved path the centripetal force is supplied by normal force
7. True For an object traveling along a vertical circular path by using a rope experience a maximum tension at the lowest point of the vertical circular path
8. _____ An object on the surface of the earth pulled by the earth towards the surface of the earth
9. False Planets revolve around the sun in a circular orbits
10. False The third law of Kepler says the cube of the period of the planet around the sun is proportional to the cube of the mean distance between the sun and the planet

II. Chose the best answer from the given alternatives

1. Given A= 3i-2j+k and B= 2i+j-4k. The angle Θ between the vectors is

a. 0° b. 30° c. 45° d. 90° e. none of the above

2. In question 1 the angle between A and the positive y-axis is

a. $\cos^{-1}\left(\frac{3}{\sqrt{14}}\right)$ b. $\cos^{-1}\left(\frac{-4}{\sqrt{14}}\right)$ c. $\cos^{-1}\left(\frac{-2}{\sqrt{14}}\right)$ d. $\cos^{-1}\left(\frac{1}{\sqrt{14}}\right)$ e. none of the above

3. In question 1 the cross product of A and B is?

a. 6i+j-k b. 7i+14j+7k c. 2i+9j-k d. i+4j-2k e. none of the above

4. A car makes a turn whose radius 28m. The road is banked at an angle of 10°. If the friction between the road and the car is zero. At what speed the driver take the curve to avoid sliding off the

Given tan 10° =0.178

a. 14.32m/s b. 6.98m/s c. 8.94 m/s d. 10m/s e. none of the above

5. A car traveling on a long straight highway, at a constant speed of 40m/s passes a police moto which moves at 20m/s but immediately accelerates at a constant rate of 2m/s² to catch the speedin How long willit take the police motorcycle to catch the speeding car?

a. 5 s b. 10 s c. 15 s d. 20 s e. none of the above

6. In question 5 how far will the police motorcycle have traveled during this time?

a. 200m b. 800m c. 600m d. 400m e. none of the above

7. In question 5 how fast will the police motorcycle be traveling when it reaches the speed

a. 10m/s b. 20m/s c. 30m/s d. 40m/s e. none of the above

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