Started on	Thursday, 10 June 2021, 1:00 PM
State	Finished
Completed on	Thursday, 10 June 2021, 2:00 PM
Time taken	59 mins 18 secs
Grade	**10.00** out of 15.00 (**67**%)

Question 1

Correct

Mark 1.00 out of 1.00

If the motion of a particle is along the radial direction then what will be the velocity of the particle in polar coordinates?

Select one:

- a. $\dot{r}\hat{r}$
- b. $\dot{r}\hat{r} + r\dot{\theta}\hat{\theta}$
- c. 0
- d. $r\dot{\theta}\hat{\theta}$

Your answer is correct.

The correct answer is: $\dot{r}\hat{r}$

Question 2

Correct

Mark 1.00 out of 1.00

If $\vec{A}$ and $\vec{B}$ are two vectors parallel to each other then determine $\vec{A} \cdot \vec{B}$.

Select one:

- a. $|AB|$
- b. $|A||B|$ ✓
- c. 1
- d. 0

Your answer is correct.

The correct answer is: $|A||B|$

Question 3

Correct

Mark 1.00 out of 1.00

If potential energy due to a force ($\vec{F}$) in a region is given by $V = 5x^2$,

what is the y-component of the $\vec{F}$ in that region?

Select one:

- a. $10y$
- b. 5
- c. 0 ✓
- d. $10x$

Your answer is correct.

The correct answer is: 0

Question 4

Correct

Mark 1.00 out of 1.00

Suppose in a system there are two interacting particles. Each particle exerts a force on the other particle. The sum of these internal forces which the particles exert on one another is

Select one:

- a. Equal to zero ✓
- b. Dependent on the interaction between the particles
- c. Equal to the total external force
- d. Ma, M = total mass of the system, a = acceleration of centre of mass

Your answer is correct.

The correct answer is: Equal to zero

Question 5

Correct

Mark 2.00 out of 2.00

If acceleration of a particle is defined as $6\hat{i}+2t^2\hat{j}+4t\hat{k}$. Then determine the magnitude of velocity at $t = 3$. Given at $t = 0$ the particle was at rest.

Answer: 31.1769 ✓

The correct answer is: 31.18

Question 6

Correct

Mark 2.00 out of 2.00

A 0.3 kg mass is attached to a spring and oscillates at linear frequency of 4.4 Hz with a Q of 92.1. Determine the proportionality constant b, where b carries the same meaning as discussed in the class.

Answer: 0.09 ✓

The correct answer is: 0.09

Question 7

Incorrect

Mark 0.00 out of 2.00

A particle of mass 5 kg is undergoing 1D SHM about the equilibrium point $x = 0$. The force acting on it is $F = -49x$. Velocity of the particle at the point $x = 2$ m was measured to be 10 m/s. What is the total energy of the particle when it is at the point $x = 2.5$ cm?

Answer: 93.1 ✗

The correct answer is: 348.00

Question 8

Correct

Mark 2.00 out of 2.00

A particle is moving in XY plane such that it has a constant speed of 5 m/s along radial direction. The angle that its position vector makes with the X axis is changing at a constant rate of 2 rad/s. Suppose at a given instant of time the particle is at a distance of r = 72 m from the origin. What is the magnitude of acceleration (m/s^2) in radial direction at that instant?

Answer: 288 ✓

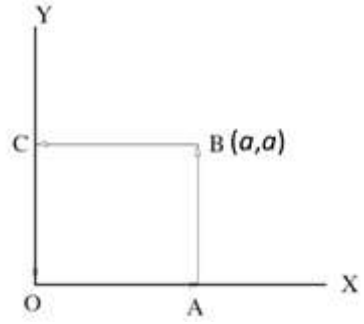
The correct answer is: 288.00

Question 9

Incorrect

Mark 0.00 out of 3.00

Consider a force $\vec{F} = y\hat{i} + 2x\hat{j}$. Calculate work done by this force in going around a closed path which is a square in the xy plane (shown in the figure). Length of the sides of the square is $a = 3.7$. The motion is in anti-clockwise direction. Keep answer upto 2 decimal places.



Answer: 41.07 ✗

The correct answer is: 13.69