

Dynamics

“MTH404” Grand quiz 2020 (Spring)

MTH404:Grand Quiz MTH404 Quiz Start Time: 06:08 PM, 12 July 2020

Question # 1 of 20 (Start time: 06:08:18 PM, 12 July 2020) Total Marks: 1

The time taken by the particle to complete one oscillation is called ----.

Select the correct option

<input type="radio"/>	amplitude
<input checked="" type="radio"/>	time period
<input type="radio"/>	frequency
<input type="radio"/>	none of these

MTH401: Quiz No. 1

Question # 1 of 10 (Start time: 11:42:43 AM, 06 December 2020)

Radial component of a particle moving in a circle is always—.

Select the correct option

- | | |
|----------------------------------|-----------|
| <input checked="" type="radio"/> | 0 |
| <input type="radio"/> | 1 |
| <input type="radio"/> | -1 |
| <input type="radio"/> | undefined |

Question # 3 of 10 (Start time: 11:45:15 AM, 06 December 2020)

The branch of applied mathematics that deals with the study of motion of a body without taking into consideration how the motion is caused is known as _____

Select the correct option

- dynamics
- statics
- fluid mechanics
- kinematics

MTH404: Quiz No. 1

Question # 4 of 10 (Start time: 11:46:47 AM, 06 December 2020)

A particle is moving with velocity

$$(3\hat{i} + 4\hat{j})ms^{-1}$$

. the normal component of velocity is ----

Select the correct option

- 25
- 5
- 8
- 0

Question # 5 of 10 (Start time: 11:47:38 AM, 06 December 2020)

A particle is moving with a velocity

$$(3\hat{i} + 4\hat{j})ms^{-1}$$

, the tangential component of velocity is—.

Select the correct option

- | | |
|----------------------------------|-------|
| <input type="radio"/> | 25m/s |
| <input checked="" type="radio"/> | 5m/s |
| <input type="radio"/> | 8m/s |
| <input type="radio"/> | 0 |

MTH404: Quiz No. 1

Question # 6 of 10 (Start time: 11:49:03 AM, 06 December 2020)

If a particle is moving with velocity

then the speed of the particle will be ----.

$$\vec{v} = (3\hat{i} + 4\hat{j})\text{ms}^{-1}$$

Select the correct option

- | | |
|----------------------------------|------|
| <input type="radio"/> | 3m/s |
| <input type="radio"/> | 4m/s |
| <input checked="" type="radio"/> | 5m/s |
| <input type="radio"/> | 7m/s |

Question # 7 of 10 (Start time: 11:50:22 AM, 06 December 2020)

If

$$\vec{r} = 2t\hat{i} + 3\hat{j}$$

is the position of a particle at time t , then which of the following represents the velocity of the particle at time t ?

Select the correct option

- | | |
|-----------------------|-------------|
| <input type="radio"/> | $2t\hat{i}$ |
| <input type="radio"/> | $2\hat{i}$ |
| <input type="radio"/> | $3\hat{j}$ |
| <input type="radio"/> | 0 |

Question # 9 of 10 (Start time: 11:52:57 AM, 06 December 2020)

Radial component of velocity is ____

Select the correct option

- | | |
|----------------------------------|------------------------|
| <input type="radio"/> | $\dot{r}\dot{\theta}$ |
| <input type="radio"/> | $\dot{r}\ddot{\theta}$ |
| <input type="radio"/> | \ddot{r} |
| <input checked="" type="radio"/> | \dot{r} |

Question # 10 of 10 (Start time: 11:54:25 AM, 06 December 2020)

if

$$\vec{v} = 3\hat{i} + 2t\hat{j}$$

be the velocity of the particle at time t , then which of the following is the acceleration of the particle at time t ?

Select the correct option

- | | |
|----------------------------------|---------------------------------|
| <input type="radio"/> | $\vec{a} = 3\hat{i} + 2\hat{j}$ |
| <input type="radio"/> | $\vec{a} = 3\hat{i}$ |
| <input checked="" type="radio"/> | $\vec{a} = 2\hat{j}$ |
| <input type="radio"/> | $\vec{a} = 0$ |

Direction of momentum is direction of object's-----.

Select the correct option

- | | |
|----------------------------------|------------------|
| <input type="radio"/> | mass |
| <input type="radio"/> | acceleration |
| <input checked="" type="radio"/> | velocity |
| <input type="radio"/> | frictional force |

If a particle is moving with zero acceleration and it starts with velocity 10m/s , then the distance traveled in 5 seconds will be ----.

Select the correct option

50m

10m

15m

60m

If Force of magnitude 10N is acting on the particle of mass 5kg, then the acceleration produced in the particle is-----.

Select the correct option

2m/s²

10m/s²

5m/s²

15m/s²

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Question # 10 of 20 (Start time: 06:13:22 PM, 12 July 2020)

If a particle is moving with constant acceleration of

$$4 \frac{m}{s^2}$$

and it starts from rest, then the velocity of particle after 5 seconds will be

Select the correct option

- | | |
|----------------------------------|-------|
| <input type="radio"/> | 4m/s |
| <input type="radio"/> | 5m/s |
| <input type="radio"/> | 9m/s |
| <input checked="" type="radio"/> | 20m/s |

Question # 12 of 20 (Start time: 06:14:57 PM, 12 July 2020)

Total Marks:

A particle of mass 10 kg is lying at a height of 5m.
Then the potential energy of the particle is-----.
Take $g=10\text{m/s}^2$.

Select the correct option

 25J 60J 500J 100J

The maximum distance covered by the particle executing simple harmonic motion in either side of mean position is called as -----.

Select the correct option

- amplitude
- time period
- frequency
- none of these

Question # 1 of 20 (Start time: 06:16:06 PM, 12 July 2020)

Total Marks:

If the acceleration is 5m/s^2 throughout the motion, the velocity-time curve will be a ----.

Select the correct option

parabola

circle

hyperbola

straight line

Question # 2 of 20 (Start time: 06:16:46 PM, 12 July 2020)

If x is the displacement of the particle at any time t , and

$$x = 5t$$

, then which of the following is the expression for the velocity of the particle.

Select the correct option

5

 $5t$

1

0

Question # 3 of 20 (Start time: 06:17:31 PM, 12 July 2020)

At mean position of pendulum, the potential energy of the pendulum is:

$$P.E = 0 \text{ j}$$

Select the correct option

- maximum
- minimum
- neither maximum nor minimum
- none of these

Question # 6 of 20 (Start time: 06:20:34 PM, 12 July 2020)

Total Marks: 1

If force of magnitude 20N is applied to the particle and it covers a distance of 3m in the same direction as that of applied force, then the magnitude of work done on the particle is-----.

Select the correct option

 20J 23J 3J 60J

Question # 20 of 20 (Start time: 06:21:19 PM, 12 July 2020)

frequency is reciprocal of -----.

Select the correct option

 time period amplitude cycle

What force can change the velocity of body of mass 1kg from 10m/s to 15m/s in one second?

Select the correct option



1N



5N



10N



15N

Total

0, then which of the following is true about the transverse component of a force in polar

 Reload Math Eq

$$F_\theta = m a \theta$$

$$F_\theta = m \theta$$

$$F_\theta = m a \ddot{\theta}$$


Question # 12 of 20 (Start time: 06:24:44 PM, 12 July 2020)

The rate of work done to the particle is known as-----.

Select the correct option

power

kinetic energy

momentum

none of these

Question # 13 of 20 (Start time: 06:25:20 PM, 12 July 2020)

Force acting on a body can change its---

Select the correct option

kinetic energy

direction of motion

speed

all of the given

Question # 18 of 20 (Start time: 06:29:09 PM, 12 July 2020)

Top

The rate of change of ----- of a particle about a point O is equal to the torque about O of the force on the particle.

Select the correct option

- angular velocity
- angular displacement
- angular momentum
- none of these

$$4 \frac{m}{s^2}$$

and it starts from rest, then the velocity of particle after 5 seconds will be---

Select the correct option

- 4m/s
- 5m/s
- 9m/s
- 20m/s

The space-time curve is a ----- for a constant velocity.

Select the correct option

circle

straight line

parabola

hyperbola

If the mass of the particle is doubled, then the gravitational force in the earth's gravitational field -----.

Select the correct option

is doubled

is trebled

remains same

none of these

A particle of mass 3kg is moving with velocity $4t\mathbf{i}+5\mathbf{j}$. The force F acting on the particle will be----

Select the correct option

$12\mathbf{i}$

$12\mathbf{j}$

$4\mathbf{i}+5\mathbf{j}$

0

If the acceleration of a particle is zero, then which of the following is true?

Select the correct option

- Distance traveled in each unit of time is constant
- Distance traveled in each unit of time is increasing
- Distance traveled in each unit of time is decreasing.
- None of the given

July 2020)

Total #

moving with velocity v , then the equation of motion, according to Newton's second law, is given by—

Reload Math Eq

$$\vec{F} = \frac{d}{dt}(m\vec{v})$$



$$\vec{F} = m\vec{v}$$

$$\vec{F} = m\vec{v}^2$$

If 150N of force is applied on a spanner of 10 cm to open a nut then the length of spanner when the force applied on it is 60 N is---

-.
-

Select the correct option

25cm

40cm

50cm

80cm

Question # 3 of 20 (Start time: 06:55:29 PM, 12 July 2020)

Total Marks

If a particle of mass 4kg is moving with speed 3m/s then the kinetic energy of the particle is-----.

Select the correct option

 12J 18J 36J 48J

Question # 4 of 20 (Start time: 06:57:00 PM, 12 July 2020)

Total Marks

If force of magnitude 20N is applied to the particle and it covers a distance of 3m in the same direction as that of applied force, then the magnitude of work done on the particle is-----.

Select the correct option

 20J 23J 3J 60J

In a conservative field of force, the total energy of a particle throughout the motion.

Select the correct option

remains constant



varies



zero



Which of the following is true for a force F to be conservative?

$\text{grad } F=0$



$\text{div } F=0$



$\text{Curl } F=0$



None of these



Question # 16 of 20 (Start time: 07:04 11 PM, 12 July 2020)

Which of the following is true about the transverse component of a force in polar coordinates?

Select the correct option



$$F_{\theta} = m(2r\dot{\theta} - r\ddot{\theta})$$



$$F_{\theta} = m(2r\dot{\theta} + r\ddot{\theta})$$



$$F_{\theta} = m(2r\dot{\theta} + 2r\ddot{\theta})$$

If a particle of mass 4kg is in motion under the action of variable Force F and is moving under velocity $3t^2$, then the force acting at time '2' seconds is -----.

Select the correct option

48N

24N

12N

7N

The branch of mathematics which deals with the motion of objects is known as.....

Select the correct option

dynamics

statics

fluid mechanics

none of these

MTH404:Quiz No. 1

Question # 4 of 10 (Start time: 03:33:18 PM, 06 December 2020)

The radial component of acceleration is —.

Select the correct option

- | | |
|-----------------------|--|
| <input type="radio"/> | $\ddot{r} - r(\dot{\theta})^2$ |
| <input type="radio"/> | $\frac{1}{r} \frac{d}{dt}(r^2 \dot{\theta})$ |
| <input type="radio"/> | $\frac{1}{r^2} \frac{d}{dt}(r^2 \dot{\theta})$ |
| <input type="radio"/> | none of these |

Question # 8 of 10 (Start time: 03:21:33 PM, 06 December 2020)

if

$$\vec{v} = 3\hat{i} + 2t\hat{j}$$

be the velocity of the particle at time t, then which of the following is the acceleration of the particle at time t?

Select the correct option

- | | |
|-----------------------|---------------------------------|
| <input type="radio"/> | $\vec{a} = 3\hat{i} + 2\hat{j}$ |
| <input type="radio"/> | $\vec{a} = 3\hat{i}$ |
| <input type="radio"/> | $\vec{a} = 2\hat{j}$ |
| <input type="radio"/> | $\vec{a} = 0$ |

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Question # 11 of 20 (Start time: 03:50:12 PM, 12 July 2020)

Which of the following is true about the radial component of a force in polar coordinates?

Select the correct option



$$F_r = m(\ddot{r} - r\dot{\theta}^2)$$



$$F_r = m(r\dot{\theta}^2 - \ddot{r})$$



$$F_r = m(\ddot{r} + r\dot{\theta}^2)$$

None of these



If a particle is moving with velocity

$$\vec{v} = (3\hat{i} + 4\hat{j})\text{ms}^{-1}$$

, then the speed of the particle will be ----

Select the correct option

3m/s



4m/s



5m/s



7m/s



Grand Quiz of Mth404

Question # 13 of 20 (Start time: 03:52:21 PM, 12 July 2020)

During S.H.M kinetic energy of the body is ---- at mean position.

Select the correct option

- | | |
|----------------------------------|---------------|
| <input type="radio"/> | minimum |
| <input checked="" type="radio"/> | maximum |
| <input type="radio"/> | zero |
| <input type="radio"/> | none of these |



Question # 1 of 20 (Start time: 03:37:53 PM, 12 July 2020)

IF

$$\vec{r} = 3t^2\hat{i} + 3\hat{j}$$

is the position of the particle at time t , then which of the following is true about the acceleration of the particle?

Select the correct option



$$\vec{a} = 6t\hat{i} + 3\hat{j}$$

$$\vec{a} = 6\hat{i} + 3\hat{j}$$

$$\vec{a} = 6\hat{i}$$

$$\vec{a} = 0$$

Question # 8 of 20 (Start time: 06:12:16 PM, 12 July 2020)

Total Marks: 1

If the velocity of the particle remains same throughout the motion, the slope of the space-time curve -----.

Select the correct option

 Does not remain the same varies Remains the same None of these

If a particle is moving with zero acceleration and it starts with velocity 10m/s, then the distance traveled in 5 seconds will be ----.

Select the correct option

- 50m
- 10m
- 15m
- 60m

Question # 5 of 20 (Start time: 08:05:03 PM, 12 July 2020)

Total Marks: 1

Force acting on a body can change its----.

Select the correct option

 kinetic energy direction of motion speed all of the given

MTH404:Grand Quiz MTH404

Question # 10 of 20 (Start time: 08:10:40 PM, 12 July 2020)

If the velocity of a particle is given by

$$v = 3t^2 + 4$$

, then the acceleration of the particle at time '3' seconds will be ----.

Select the correct option

<input checked="" type="radio"/>	18
<input type="radio"/>	6
<input type="radio"/>	3
<input type="radio"/>	0

Question # 13 of 20 (Start time: 08:16:27 PM, 12 July 2020)

Which of the following is true about the radial component of a force in polar coordinates?

Select the correct option



$$F_r = m(\ddot{r} - r(\dot{\theta})^2)$$



$$F_r = m(r(\dot{\theta})^2 - \ddot{r})$$



$$F_r = m(\ddot{r} + r(\dot{\theta})^2)$$



None of these

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Quiz Start Time: 08:20 PM, 12 July 2020

Time: 08:22:55 PM, 12 July 2020

Total Marks

Force on a particle of mass m moving with velocity v , then the equation of motion, according to Newton's second law, is given by—

Reveal Math Equations

$$\vec{F} = \frac{d}{dt}(m\vec{v})$$

$$\vec{F} = m\vec{v}$$

$$\vec{F} = m\vec{v}^2$$

Click to Save Answer & Move to Next Question

Question # 16 of 20 (Start time: 08:23:13 PM, 12 July 2020)

Total Marks:

The maximum distance covered by the particle executing simple harmonic motion in either side of mean position is called as -----.

Select the correct option

- amplitude
- time period
- frequency
- none of these

The motion along a straight line is called-----.

Select the correct option

circular motion

rectilinear motion

projectile motion

none of these

Question # 11 of 20 (Start time: 09:02:22 PM, 12 July 2020)

If x is the displacement of particle from a fixed point at any time t and is given by

$$x = 5t^2$$

, then which of the following will be the expression for the acceleration of the particle?

Select the correct option

- | | |
|----------------------------------|-----|
| <input checked="" type="radio"/> | 10 |
| <input type="radio"/> | 10t |
| <input type="radio"/> | 5t |
| <input type="radio"/> | 5 |

Question # 3 of 20 (Start time: 06:09:41 PM, 12 July 2020)

Total Marks: 1

If S is the system of particles which is in equilibrium, then the sum of all forces on the system S is-----.

Select the correct option

- | | |
|----------------------------------|---------------|
| <input type="radio"/> | undefined |
| <input checked="" type="radio"/> | zero |
| <input type="radio"/> | very large |
| <input type="radio"/> | none of these |

Question # 9 of 20 (Start time: 06:23:05 PM, 12 July 2020)

When the acceleration is a function of distance only, we may write

$$a(x) = \text{--- --}$$

Except

Select the correct option

- | | |
|-----------------------|---------------------|
| <input type="radio"/> | $\frac{dx}{dt}$ |
| <input type="radio"/> | $\frac{dv}{dt}$ |
| <input type="radio"/> | $\frac{d^2x}{dt^2}$ |
| <input type="radio"/> | None of these |

Question # 14 of 20 (Start time: 06:15:59 PM, 12 July 2020)

Total Marks: 1

A body of mass 5 g is executing SHM about a point O with amplitude 100 cm. If its max. velocity is 100 cm/sec, its velocity will be 50 cm/sec at a distance (in cm):

Select the correct option

[Reload Math Equations](#)

<input type="radio"/>	5
<input type="radio"/>	$50\sqrt{2}$
<input type="radio"/>	$50\sqrt{3}$
<input type="radio"/>	$10\sqrt{3}$

[View or Hide Answer & Mark of Each Question](#)

Question # 12 of 20 (Start time: 06:24:44 PM, 12 July 2020)

The rate of work done to the particle is known as-----.

Select the correct option



power



kinetic energy



momentum



none of these

If F is the central force, then the rate of change of angular momentum is -----.

Select the correct option

positive

zero
B not sure

negative

none of these