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State	Finished
Completed on	Tuesday, 9 February 2021, 6:26 PM
Time taken	25 mins 1 sec
Marks	18.00/25.00
Grade	**10.80** out of 15.00 (**72**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Question Cart A is at rest. An identical cart B, moving to the right, collides elastically with cart A. After the collision, which of the following is true?

1. Carts A and B are both at rest.
2. Cart B stops and cart A moves to the right with speed equal to the original speed of cart B.
3. Cart A remains at rest and cart B bounces back with speed equal to its original speed.
4. Cart A moves to the right with a speed slightly less than the original speed of cart B and cart B moves to the right with a very small speed.

- a. 3
- b. 1
- c. 2 ✔
- d. 4

The correct answer is:
2

Question **2**

Correct

Mark 1.00 out of 1.00

The natural frequency of a spring-mass system on earth is ω_n. The natural frequency of this system on the moon $(g_{moon}=g_{earth}/6)$ is

(a) ω_n

(b) $0.408\omega_n$

(c) $0.204\omega_n$

(d) $0.167\omega_n$

- i. (d)
- ii. (a) ✔
- iii. (c)
- iv. (b)

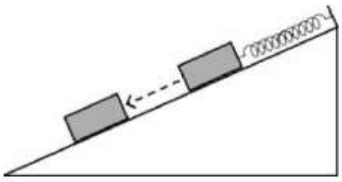
The correct answer is:
(a)

Question **3**

Incorrect

Mark 0.00 out of 1.00

Question : A block of inertia m is attached to a relaxed spring on an inclined plane. The block is allowed to slide down the incline, and comes to rest. The coefficient of kinetic friction of the block on the incline is μ_k. For which definition of the system is the change in total energy (after the block is released) zero?



1. block
2. block + spring
3. block + spring + incline
4. block + spring + incline + Earth

a. 4

b. None

c. 1

d. 3

e. 2

The correct answer is:
4

Question **4**

Correct

Mark 1.00 out of 1.00

Question Consider a person standing in an elevator that is accelerating upward. The upward normal force N exerted by the elevator floor on the person is

1. larger than

2. identical to

3. smaller than

the downward force of gravity on the person.

- a. None
- b. 1 ✔
- c. 3
- d. 2

The correct answer is:
1

Question **5**

Incorrect

Mark 0.00 out of 1.00

When a body moves over a frictional surface, its acceleration:

(a) Decreases with increase of friction

(b) Increases with increase of friction

(c) Is independent of frictional force

(d) None of the above

- a. (d)
- b. (a)
- c. (c)
- d. (b) ✖

The correct answer is:
(a)

Question **6**

Correct

Mark 1.00 out of 1.00

Coefficient of restitution for a perfectly elastic collision is

(a) equal to zero

(b) equal to one

(c) between zero and one

(d) greater than one

- i. (d)
- ii. (a)
- iii. (c)
- iv. (b) ✔

The correct answer is:
(b)

Question **7**

Incorrect

Mark 0.00 out of 1.00

What is the unit of impulse?

(a) N. s

(b) Kg m/s

(c) None of the above

(d) Both a and b

- i. (a) ✖
- ii. (c)
- iii. (b)
- iv. (d)

The correct answer is:
(d)

Question **8**

Correct

Mark 1.00 out of 1.00

Force exerted on a body changes it's

(a) Direction of motion

(b) Momentum

(c) Kinetic energy

(d) All the above

i. (d) ✔

ii. (c)

iii. (b)

iv. (a)

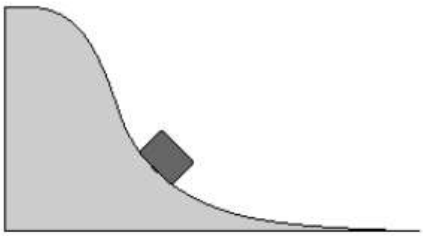
The correct answer is:
(d)

Question **9**

Correct

Mark 1.00 out of 1.00

Question 9 A cart on a roller coaster rolls down the track shown below. As the cart rolls beyond the point shown, what happens to the components of the velocity and acceleration in the direction of motion?



a) Both decrease;
b) The speed decreases, but the acceleration increases;
c) Both remain constant;
d) The speed increases, but acceleration decreases;
e) Both increase;
f) Some other combination.

- i. b
- ii. d ✔
- iii. c
- iv. e
- v. f
- vi. a

The correct answer is:
d

Question **10**

Correct

Mark 1.00 out of 1.00

When there is no external force acts on the system total linear momentum is conserved"- What is this statement

(a) Law of conservation of momentum

(b) Law of conservation of force

(c) Law of conservation of mass

(d) Law of conservation of energy

- a. (c)
- b. (b)
- c. (d)
- d. (a) ✔

The correct answer is:
(a)

Question **11**

Correct

Mark 1.00 out of 1.00

In forced oscillation of a particle the amplitude is maximum for a frequency ω1 of force, while the energy is maximum for frequency ω2 of the force then

(a) ω1=ω2

(b) ω1>ω2

(c) ω1<ω2 when damping is small and ω1>ω2 when damping is large

(d) ω1<ω2

- i. (c)
- ii. (b)
- iii. (a) ✔
- iv. (d)

The correct answer is:
(a)

Question **12**

Correct

Mark 1.00 out of 1.00

When two bodies collide elastically, then

(a) Kinetic energy of the system alone is conserved

(b) Only momentum is conserved

(c) Both energy and momentum are conserved

(d) Neither energy nor momentum is conserved

a. (d)

b. (c) ✔

c. (a)

d. (b)

The correct answer is:
(c)

Question **13**

Correct

Mark 1.00 out of 1.00

What will be coefficient of restitution when height of ball after first bounce is 30 cm and height of ball at rest is 43 cm?

a. 0.122

b. 1

c. None

d. 0.955

e. 0.835 ✔

The correct answer is:
0.835

Question **14**

Correct

Mark 1.00 out of 1.00

In the ideal case of zero damping, the amplitude of forced harmonic motion at resonance is:

(a) zero

(b) infinite

(c) cannot be said

(d) varies from zero to infinite

- i. (c)
- ii. (a)
- iii. (b) ✔
- iv. (d)

The correct answer is:
(b)

Question **15**

Correct

Mark 1.00 out of 1.00

During a pool game the cue ball is short at the red ball. When the cue ball strikes the red ball, the cue ball stops dead, and the red ball moves away at the same velocity the cue ball had before the collision the type of collision represented in the example is:

(a) A perfectly inelastic collision

(b) An elastic collision

(c) An inelastic collision

(d) All the above

- a. (c)
- b. (b) ✔
- c. (a)
- d. (d)

The correct answer is:
(b)

Question **16**

Correct

Mark 1.00 out of 1.00

In uniformly accelerated motion, the shape of the displacement- time graph is:

(a) Hyperbola

(b) Parabola

(c) Straight line

(d) No fixed shape

- a. (b) ✔
- b. (c)
- c. (a)
- d. (d)

The correct answer is:
(b)

Question **17**

Correct

Mark 1.00 out of 1.00

What will be the least count (in mm) of the screw gauge when pitch =0.5mm and 50 circular division?

- a. 0.01 ✔
- b. None
- c. 0.1
- d. 0.001

The correct answer is:
0.01

Question **18**

Incorrect

Mark 0.00 out of 1.00

Question Two balls that are dropped from a height h_i above the ground, one on top of the other. Ball 1 is on top and has mass m_1, and ball 2 is underneath and has mass m_2 with $m_2 >> m_1$. Ball 2 first collides with the ground and rebounds with speed v_0 Then, as ball 2`starts to move upward, it collides elastically with the ball 1 which is still moving downwards also with speed v_0. The final relative speeds after ball 1 and ball 2 collide is

1. Zero
2. v_0
3. $2v_0$
4. $3v_0$
5. None of the above.

a. 2

b. 1

c. 4

d. 5

e. 3

The correct answer is:
3

Question **19**

Incorrect

Mark 0.00 out of 1.00

Statement of Newton's second law (Choose only one most appropriate option):

(a) F = m(dv/dt),

(b) F = ma

(c) F = dp/dt

(d) All of the above

- a. (d)
- b. (a)
- c. (c) ✖
- d. (b)

The correct answer is:
(d)

Question **20**

Correct

Mark 1.00 out of 1.00

A lead ball strikes a wall and falls down, a tennis ball having the same mass and velocity strikes the wall and bounces back. Check the correct statement.

(a) The lead ball suffers a greater change in momentum compared with the tennis ball

(b) The tennis ball suffers a greater change in momentum as compared with the lead ball

(c) The momentum of the lead ball is greater than that of the tennis ball

(d) Both suffer an equal change in momentum

- i. (b) ✔
- ii. (a)
- iii. (c)
- iv. (d)

The correct answer is:
(b)

Question **21**

Correct

Mark 1.00 out of 1.00

Two objects having equal masses and velocities collide with each other and come to a rest. What type of a collision is this and why?

(a) Elastic collision, because kinetic energy is conserved

(b) Inelastic collision, because kinetic energy is not conserved

(c) Elastic collision, because kinetic energy is not conserved

(d) Inelastic collision, because kinetic energy is conserved

a. (a)

b. (c)

c. (b) ✔

d. (d)

The correct answer is:
(b)

Question **22**

Correct

Mark 1.00 out of 1.00

The restoring force in a simple harmonic motion is _____ in magnitude when the particle is instantaneously at rest.

(a) zero

(b) minimum

(c) maximum

(d) None of the above

i. (d)

ii. (c) ✔

iii. (a)

iv. (b)

The correct answer is:
(c)

Question **23**

Correct

Mark 1.00 out of 1.00

In damped harmonic oscillation which one decreases?

(a) amplitude of vibration

(b) energy of vibration

(c) both amplitude and energy

(d) neither amplitude nor energy

- i. (a)
- ii. (c) ✔
- iii. (b)
- iv. (d)

The correct answer is:
(c)

Question **24**

Incorrect

Mark 0.00 out of 1.00

Question : You are pushing a wooden crate across the floor at constant speed. You decide to turn the crate on end, reducing by half the surface area in contact with the floor. In the new orientation, to push the same crate across the same floor with the same speed, the force that you apply must be about

1. four times as great
2. twice as great
3. equally great
4. half as great
5. one-fourth as great

as the force required before you changed the crate's orientation.

- a. 1
- b. 3
- c. 5 ✖
- d. 4
- e. 2

The correct answer is:
3

Question **25**

Incorrect

Mark 0.00 out of 1.00

A bullet of mass 20 gm is fired from a rifle of mass 8 kg with a velocity of 100 m/s. The magnitude of velocity of recoil of the refile is:

(a) 0.25m/s

(b) 25m/s

(c) 2.5m/s

(d) 250m/s

- i. (c)
- ii. (d)
- iii. (b) ✖
- iv. (a)

The correct answer is:
(a)

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