

$$EF = ma$$



PHYSICS

105



2021-2022



TEST BANK

First exam material

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Which among the following is a vector quantity?

A Mass	B Displacement	C Temperature	D Density
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1-

2- All of the following are base units of the SI system except:

- A) kilogram.
- B) kelvin.
- C) meter.
- D) volt.

3- What is the conversion factor between km/h² and m/s²?

- A) $7.72 \times 10^{-6} \text{ m/s}^2$
- B) $2.78 \times 10^{-1} \text{ m/s}^2$
- C) $1.30 \times 10^4 \text{ m/s}^2$
- D) 3.60 m/s^2

What is the rate of acceleration of gravity at the Earth's surface?

A 6.7 m/s^2	B 7.8 m/s^2	C 9.8 m/s^2	D 11.2 m/s^2
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4-

1	2	3	4
B	D	A	C

5- The number of significant figures in 10001 is

- A) two.
- B) three.
- C) five.
- D) six.

6- The number of significant figures in 0.01500 is

- A) two.
- B) three.
- C) four.
- D) five.

How can we calculate the velocity of a vehicle?

A Divide the travelled distance by the taken time	B Divide the taken time by the travelled distance	C Multiply the travelled distance with the taken time	D Multiply the taken time by the travelled distance
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7-
8- Starting from city A, a car drives 250 miles east to city B, then 300 miles north to city C, and finally 700 miles west to city D. What is the distance between city A and city D?

- A) 300 mi
- B) 400 mi
- C) 500 mi
- D) 600 mi

5	6	7	8
C	C	A	C

9- A person stands 35.0 m from a flag pole. With a protractor at eye level, he finds that the angle at the top of the flag pole makes with the horizontal is 25.0 degrees. How high is the flag pole? (The distance from his feet to his eyes is 1.7 m.)

- A) 10 m
- B) 20 m
- C) 30 m
- D) 80 m



A car travels 90 meters due north in 15 seconds. Then the car turns around and travels 40 meters due south. What is the magnitude and direction of the car's resultant displacement?

A

40 metres, South

B

50 metres, South

C

50 metres, North

D

40 metres, North

10-

11- Suppose that an object travels from one point in space to another. Make a comparison between the displacement and the distance traveled.

- A) The displacement is either greater than or equal to the distance traveled.
- B) The displacement is always equal to the distance traveled.
- C) The displacement is either less than or equal to the distance traveled.
- D) The displacement can be either greater than, smaller than, or equal to the distance traveled.

12- A new car manufacturer advertises that their car can go "from zero to sixty in 8 s". This is a description of

- A) average speed.
- B) instantaneous speed.
- C) average acceleration.
- D) instantaneous acceleration.

9	10	11	12
B	C	C	C

Newton's Second Law says that force equals mass times _____.

A

acceleration

B

height

C

heat

D

3.14

13-

14- Suppose that an object is moving with a constant velocity. Make a statement concerning its acceleration.

- A) The acceleration must be constantly increasing.
- B) The acceleration must be constantly decreasing.
- C) The acceleration must be a constant non-zero value.
- D) The acceleration must be equal to zero

15- Suppose that an object is moving with constant acceleration. Make a statement concerning its motion with respect to time.

- A) In equal times its speed increases by equal amounts.
- B) In equal times its velocity changes by equal amounts.
- C) In equal times it moves equal distances.
- D) A statement cannot be made using the information given.

16- Objects A and B both start from rest. They both accelerate at the same rate. However, object A accelerates for twice the time as object B. What is the distance traveled by object A compared to that of object B?

- A) the same distance
- B) twice as far
- C) three times as far
- D) four times as far

13	14	15	16
A	D	B	D

17- When an object is released from rest and falls in the absence of friction, which of the following is true concerning its motion?

- A) The speed of the falling object is proportional to its mass.
- B) The speed of the falling object is proportional to its weight.
- C) The speed of the falling object is inversely proportional to its surface area.
- D) None of the above is true.

The SI unit for measuring work and energy is

A Joule	B Watt	C Farad	D Ohm
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18-

19- Suppose a ball is thrown straight up. Make a statement about the velocity and the acceleration when the ball reaches the highest point.

- A) Both its velocity and its acceleration are zero.
- B) Its velocity is zero and its acceleration is not zero.
- C) Its velocity is not zero and its acceleration is zero.
- D) Neither its velocity nor its acceleration is zero.

20- Suppose a ball is thrown straight up. What is its acceleration just before it reaches its highest point?

- A) zero
- B) slightly less than g
- C) exactly g
- D) slightly greater than g

17	18	19	20
D	A	B	C

Energy stored in a material due to its position or configuration is known as what?

A

Kinetic

B

Potential

C

Latent

D

Sensible

21-

22- A car travels 40 kilometers at an average speed of 80 km/h and then travels 40 kilometers at an average speed of 40 km/h. The average speed of the car for this 80 km trip is:

- A) 40 km/h
- B) 45 km/h
- C) 53 km/h
- D) 60 km/h
- E) 80 km/h

23- Q2) A car starts from rest and goes down a slope with a constant acceleration of 5 m/s^2 . After 5 seconds the car reaches the bottom of the hill. What is its speed at the bottom of the hill?

- A) 1 m/s
- B) 12.5 m/s
- C) 25 m/s
- D) 50 m/s
- E) 160 m/s

24- A 5.0-kg block is on an incline that makes an angle 30° with the horizontal. If the coefficient of static friction is 0.5, the maximum force that can be applied parallel to the plane without moving the block is:

- A) 0 N
- B) 3.4 N
- C) 21.1 N
- D) 45.6 N
- E) 55 N

21	22	23	24
B	C	C	D

25- A 5.0-kg block is resting on a horizontal plank. The coefficient of static friction is 0.50 and the coefficient of kinetic friction is 0.40. After one end of the plank is raised so the plank makes an angle of 30° with the horizontal, the force of friction is:

- A) 0 N
- B) 17 N
- C) 20 N
- D) 25 N
- E) 49 N

26- Q12) A 5.0-kg block is on an incline that makes an angle of 30° with the horizontal. If the coefficient of static friction is 0.50, the minimum force that can be applied parallel to the plane to hold the block at rest is:

- A) 0 N
- B) 3.4 N
- C) 21.1 N
- D) 24.5 N
- E) 46 N

which of the following best describe Displacement?

<p>A is the measure of the distance an object travels in a given amount of time.</p>	<p>B the starting point you choose to describe the location , or position , of an object.</p>	<p>C the difference between the initial or starting position and the final position.</p>	<p>D an object's distance and direction from a reference point.</p>
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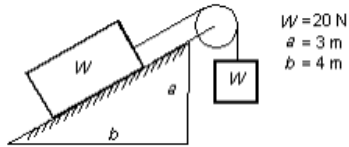
27-

28- A 5.0-kg block is on an incline that makes an angle 30° with the horizontal. If the coefficient of static friction is 0.5, the maximum force that can be applied parallel to the plane without moving the block is:

- A) 0 N
- B) 3.4 N
- C) 21.1 N
- D) 45.6 N
- E) 55 N

25	26	27	28
B	B	C	D

The system shown remains at rest. The force of friction on the block on the slope is:



- A 4 N
- B 8 N
- C 12 N
- D 16 N
- E 20 N

29-

30- A 1000-kg airplane moves in straight flight at constant speed. The force of air friction is 1800 N. The net force on the plane is:

- A) 0 N
- B) 11600 N
- C) 1800 N
- D) 9800 N
- E) none of these

31- A rock is dropped from the top of a vertical cliff and takes 3.00 s to reach the ground below the cliff. A second rock is thrown vertically from the cliff, and it takes this rock 2.00 s to reach the ground below the cliff from the time it is released. With what velocity was the second rock thrown, assuming no air resistance?

- A) 4.76 m/s upward
- B) 5.51 m/s downward
- C) 12.3 m/s upward
- D) 4.76 m/s downward
- E) 12.3 m/s downward

An object moving along the x-axis has an initial velocity $v = 1 \text{ m/s}$ at $t = 0$. Its velocity two seconds later is -3 m/s . What is the average acceleration (in m/s^2) of the particle between $t = 0$ and $t = 2\text{s}$?

- A) 2
- B) 4
- C) 0
- D) -2
- E) -4

32-

29	30	31	32
B	A	E	D

33- Q2) A stone is projected vertically upwards from the surface of the ground with an initial speed of 15 m/s. Its average speed (in m/s) over the time interval from its projection to the moment just before hitting the ground is:

- A) 7.5 B) 9.8 C) 0 D) 12.5 E) 5.9

34- What is the formula for work?

A

Force = work × distance

B

Distance = force × work

C

Work = force × distance

D

Work = force × mass

35- Q4) A helicopter is ascending vertically upwards at a constant speed of 12 m/s. When it is at a height of 60 m above the ground it releases a box. The speed (in m/s) of the box just before it hits the ground is:

- A) 12 B) 34.3 C) 16.7 D) 9.8 E) 36.3

36- Fred kicks a ball with a force of 20N to George, who is 5M away.

How much work was done to the ball?

A

25 J

B

100 J

C

4 J

D

75 J

33	34	35	36
A	C	E	B

If a system is *isolated*, the total energy of the system

A

Increases constantly.

B

Decreases constantly.

C

Is constant.

D

Depends on the work done on the system.

E

Depends on the work done by the system.

37-

Q3) A car is moving along the positive x-axis at a constant speed of 15 m/s. The driver notices a red traffic light 30 m ahead of him. Thus the driver immediately applies the breaks, and the car decelerates uniformly at 3 m/s^2 . Which of the following statements is correct?

- A) The car will stop at a position 7.5 m before reaching the traffic light.
- B) The car will stop at a position 7.5 m after the traffic light.
- C) The car will stop at a position 2.5 m before reaching the traffic light.
- D) The car will stop at a position 2.5 m after the traffic light.
- E) The car will stop exactly at the position of the traffic light.

38-

Q5) In each figure, the set of forces act on an object. Which set does NOT change the state of motion of the object?

A)



B)



C)



D)

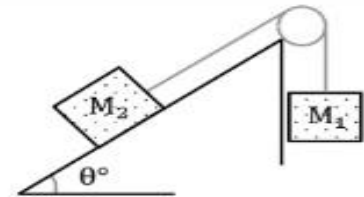


E)



39-

In the figure, $M_1 = 5 \text{ kg}$, $M_2 = 8 \text{ kg}$ and $\theta = 30^\circ$. All the surfaces are frictionless. The acceleration (in m/s^2) of mass M_2 is:



A) 2.5 DOWN THE INCLINE

B) 2.5 UP THE INCLINE

C) 0.75 DOWN THE INCLINE

D) 0.75 UP THE INCLINE

E) 0

40-

37	38	39	40
C	B	B	C

An object moving along the x-axis has an initial velocity $v = 1\text{ m/s}$ at $t = 0$. Its velocity two seconds later is -7 m/s . What is the average acceleration in (m/s^2) of the particle between $t = 0$ and $t = 2$?

- A) 2 B) 4 C) 0 D) -2 E) -4

41-

A stone is projected vertically upward from the surface of the ground with an initial speed of 25 m/s . Its average speed (in m/s) over the time interval from its projection to the moment just before hitting the ground is:

- A) 7.5 B) 9.8 C) 0 D) 12.5 E) 5.9

42-

Which of the following statements is WRONG?

- A) While mass is a scalar quantity, weight is a vector quantity.
B) The action force and the reaction force can never act on the same object.
C) If an object is moving at constant velocity, then the resultant force acting on it is zero.
D) An object can move at constant velocity if only one force acts on it.
E) The acceleration is always along the direction of the resultant force.

43-

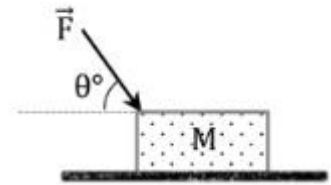
You run a race with a friend. At first your kinetic energy is the same as his kinetic energy, but he is running faster than you are. When you increase your speed by 20 percent, you are running at the same speed he is. If your mass is 105 kg what is his mass (in kg)?

- A) 88 B) 73 C) 115 D) 96 E) 81

44-

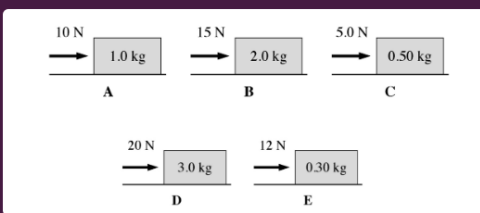
41	42	43	44
E	D	D	B

In the figure the force $F = 20\text{N}$, $M = 4\text{kg}$, $\theta = 30^\circ$ and the coefficient of kinetic friction between the ground and the block is $\mu_k = 0.2$, The acceleration of the block is:



- A) 4.98 B) 6.81 C) 1.87 D) 9.81 E) 5.73

45-

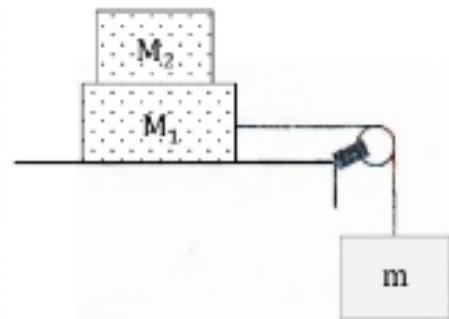


Each of the boxes shown is pulled for 10 m across a level, frictionless floor by the force given. Which box experiences the greatest change in its kinetic energy?

A row of five colored boxes labeled A, B, C, D, and E. Box A is blue, B is teal, C is orange, D is pink, and E is purple.

46-

In the figure, all surfaces are rough, $M_1 = 4\text{ kg}$ and $M_2 = 2\text{ kg}$ and the coefficient of friction $\mu_s = 0.5$ and $\mu_k = 0.2$ for all surfaces. Find the maximum value of mass m (in kg) such that mass M_2 will move with mass M_1 without sliding. Ignore masses of all strings and the mass of the pulley.



- A) 84 B) 23 C) 60 D) 33 E) 4.9

47-

45	46	47
C	D	A

48- An object is thrown vertically upwards with an initial speed of 30 m/s. After 4 s, the object is:

- A) moving down at 20 m/s
- B) moving up at 20 m/s
- C) at its maximum height
- D) moving down at 9.2 m/s

49- Which of the following statements is CORRECT?

- A) an object can accelerate even when the net force acting on it is zero.
- B) when you walk forward without skidding, the static friction is the force that caused you to move.
- C) weight is a scalar quantity.
- D) the normal force is the reaction force to the weight of an object.
- E) acceleration is always in opposite direction to the resultant force

50- A force accelerates a body of mass M . The same force applied to a second body produces three times the acceleration. The mass of the second body will be:

- A) $2M$
- B) $M/3$
- C) $M/2$
- D) $9M$
- E) $3M$

51- What force (in N) is needed to stop a 1000-kg car moving at 25 m/s during a time interval of 10 seconds?

- A) 400
- B) 500
- C) 250
- D) 2000
- E) 2500

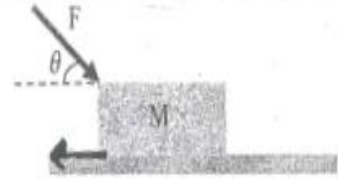
52- A PHY-105 student on the moon releases an apple from a height of 1.25 m above the surface on the Moon. The speed of the apple just before it hits the moon's surface is : (Recall that the acceleration of gravity on the moon is one-sixth that on the earth)

- A) Zero
- B) 24.50
- C) 4.95
- D) 2.02
- E) 4.08

48	49	50	51	52
D	B	B	E	E

Q7) In the figure the force $F = 40 \text{ N}$, $M = 4 \text{ kg}$, $\theta = 30^\circ$ and the coefficient of kinetic friction between the ground and block is $\mu_k = 0.2$. The Acceleration (in m/s^2) of the block is:

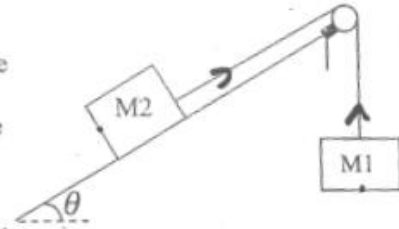
- A) 0.4 B) 3.5 C) 8.2
 D) 9.8 E) 5.7



53-

Q8) In the figure $M_1 = 3 \text{ kg}$, $M_2 = 5 \text{ kg}$ and $\theta = 30^\circ$. All the surfaces are frictionless. The acceleration (in m/s^2) of mass M_2 is:

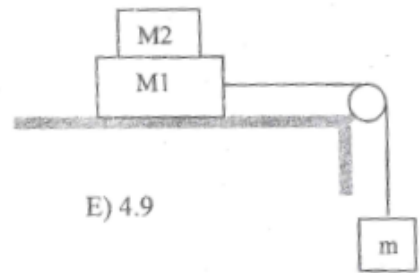
- A) 0.6 up the incline B) 0.6 down the incline
 C) 2.5 up the incline D) 2.5 down the incline
 E) 0



54-

Q9) In the figure, all surfaces are rough. $M_1 = 3 \text{ kg}$ and $M_2 = 1 \text{ kg}$ and the coefficients of friction $\mu_s = 0.5$ and $\mu_k = 0.2$ for all surfaces. Find the maximum value of mass m (in kg) such that mass M_2 will move with mass M_1 without sliding. Ignore masses of all strings and the mass of the pulley.

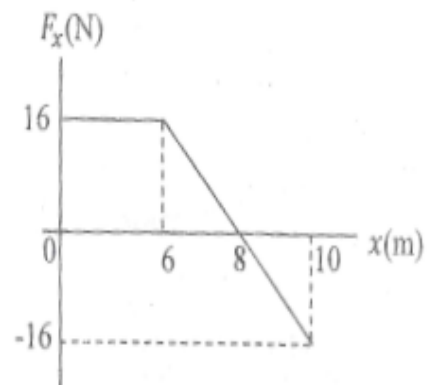
- A) 2.8 B) 3.7 C) 4.0 D) 5.6 E) 4.9



55-

Q11) A 4.0-kg object starts moving from the origin with a speed of 2 m/s under the effect of a variable force F_x that acts along the x-axis as shown in the figure. The speed (in m/s) of the object at $x = 10 \text{ m}$ is:

- A) 9.8 B) 6.9 C) 7.2
 D) 10.0 E) 1.1

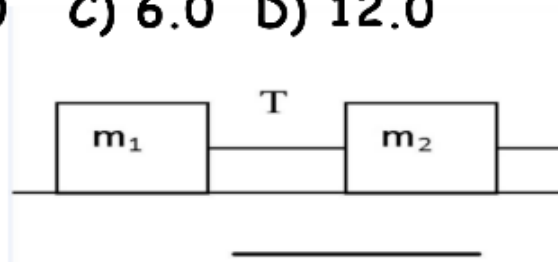


56-

53	54	55	56
E	A	D	C

22. Two masses $m_1 = 2.0 \text{ kg}$ and $m_2 = 4.0 \text{ kg}$ are connected by a light inextensible string as shown in the figure. The system is pulled along a frictionless surface by a force $F = 18 \text{ N}$. The value of the tension T (in N):

- A) 24.0 B) 3.0 C) 6.0 D) 12.0**



57-

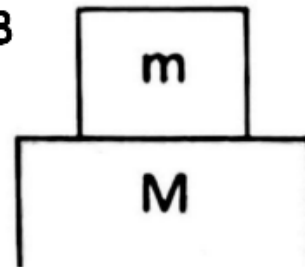
21. A block of mass $m = 4.0 \text{ kg}$ slides down a 35° incline when a force of $F = 10 \text{ N}$ is applied upward parallel to the incline. If the coefficient of kinetic friction between the block and the incline is 0.2 , find the acceleration (in m/s^2) of the block as it moves down the inclined plane:

- A) 3.1 B) 4.0 C) 0.44 D) 2.7 E) 1.5

58-

23. In the figure mass $M = 4.0 \text{ kg}$ and mass $m = 2.0 \text{ kg}$. The ground surface is frictionless, while the coefficient of static friction between the two masses is 0.30 . Find the maximum value of F (in N) such that mass m moves with mass M without sliding.

- A) 25.9 B) 3.2 C) 17.6 D) 11.8**



59-

57	58	59
E	C	C

60- HOW ARE YOU 😊 😞 😓 ?

KEEP **FIGHTING**, YOU CAN DO IT



الله يوفقكم و يحقق كل امانيكم و احلامكم