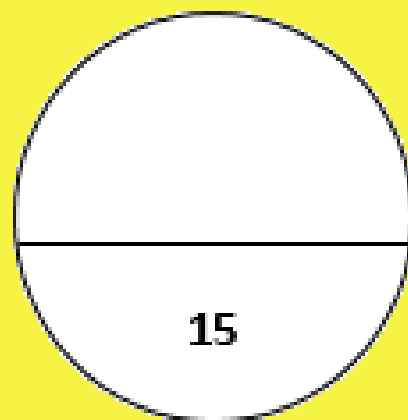
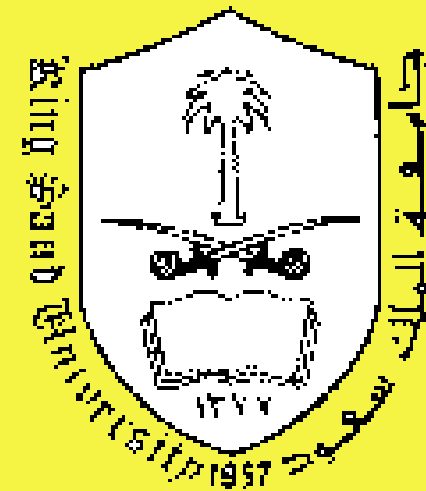


King Saud University
College of Science
Department of Physics and Astronomy



2nd term 1435-1436	Physics 103	2nd mid term
Monday 22 /7/ 1436 H	11th May 2015	7:00 – 8:30 PM

حل أسئلة الاختبار
أ.د. ناصر بن صالح الزايد

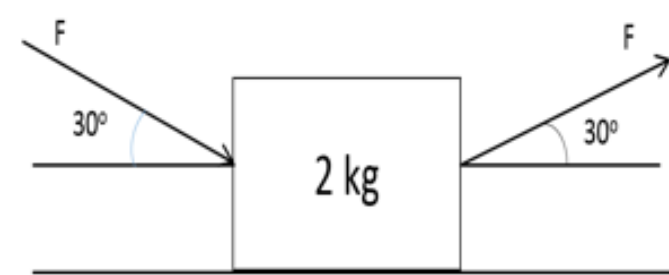
1

A toy teddy bear is dragged along the floor by a horizontal force that is parallel to the floor, the magnitude of the force of friction

- a. is independent of velocity or acceleration.
- b. increases when the velocity increases.
- c. is proportional to the acceleration.
- d. decreases when the force parallel to the floor increases.
- e. increases when the force parallel to the floor increases.

2

Find the magnitude of the acceleration on the object in the picture. Each force equals 15 N, the object's mass is 2 kg. All surfaces are frictionless



a) 13.0 m/s^2

b) 8.7 m/s^2

c) 4.3 m/s^2

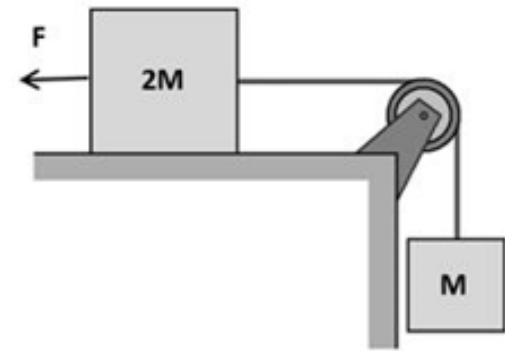
d) 3 m/s^2

e) 4 m/s^2

3

Assuming that all surfaces are frictionless, if $F = 50 \text{ N}$ and $M = 2 \text{ kg}$, the tension in the connecting string would be

- a) 16 N b) 30 N c) 10 N d) 20 N e) 25 N



4.	<p>A 6.0-kg block slides down a 35° incline at a constant speed when a 16-N force is applied acting up and parallel to the incline. What is the coefficient of kinetic friction between the block and the surface of the incline?</p> <p>a) 0.2 b) 0.30 c) 0.37 d) 0.26 e) 0.43</p>
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5.	The apparent weight of a fish in an elevator is greater than the actual one when the elevator				
a. moves down-ward at constant velocity	b. moves upward at constant velocity.	c. accelerates downward	d. accelerates upward	e. is not moving	

6

A small object is suspended from a string of length 1 m. The object revolves with constant speed v on a horizontal circle (conical pendulum) as the string makes an angle $\theta = 30^\circ$ with the vertical (as shown in the figure). The object speed v is:

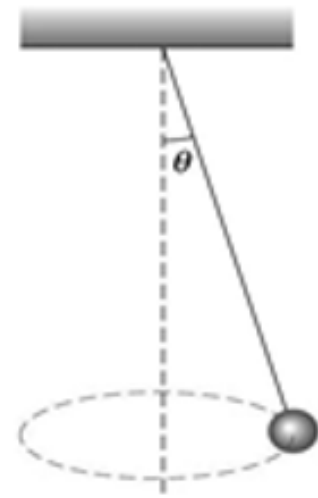
a) 1.7 m/s

b) 2.2 m/s

c) 2.9 m/s

d) 1.1 m/s

e) 2.4 m/s



7. You are riding a Ferris wheel (as shown in the figure) that is rotating with constant speed in vertical plane. The direction of your centripetal acceleration when you are at the bottom of the wheel is

- a) upward b) downward c) to the left
- d) to the right e) impossible to determine



8

A race car travels with constant speed of 40 m/s around a banked (45° with the horizontal) circular (radius = 0.2 km) track. The magnitude of the resultant force on the 80 kg driver of this car is:

a) 0.16 kN

b) 0.64 kN

c) 0.82 kN

d) 1.1 kN

e) 2.56 kN

9

A kilo-watt-hour is a unit of

a) power

b) force

c) energy

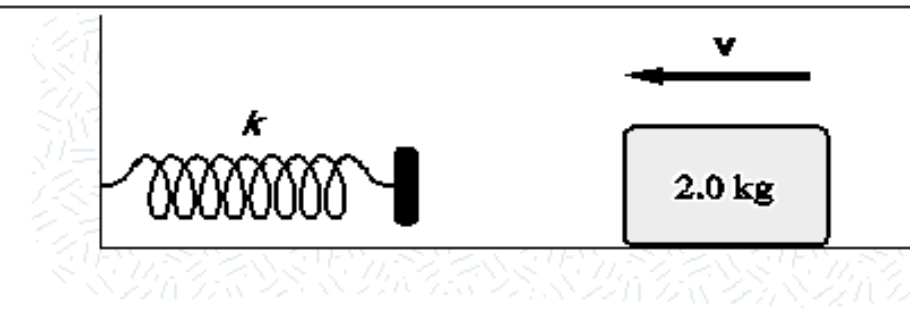
d) acceleration

e) linear momentum

10	A person is lifting a 2.0-kg object from the bottom of a well at a constant speed of 2.0 m/s for 5.0 s. Work done by the person is
	a) 0.39 kJ b) 0.20 kJ c) 0.49 kJ d) 0.27 kJ e) 0.31 kJ

11

The block is sliding on the frictionless horizontal surface as shown in figure. The speed of the block before it touches the spring (spring constant $k = 2.0 \text{ kN/m}$) is 6.0 m/s . The maximum compression in the spring is



a) 15 cm

b) 27 cm

c) 19 cm

d) 32 cm

e) not sufficient data

12

When a ball rises vertically to a height h and returns to its original point of projection, the work done by the gravitational force is

a) $-mgh$

b) $+mgh$

c) 0

d) $-2mgh$

e) $+2mgh$

13

Omar makes a high jump on the ground; he leaves the ground with vertical velocity component 6 m/s. The maximum height of his center of mass as he makes the jump is:

a) 0.45 m

b) 0.82 m

c) 1.84 m

d) 1.28 m

e) 2.05 m

14 A 70 kg diver steps off a 10 m tower and drops straight down into the water. If he comes to rest 5 m beneath the surface of the water, the average resistance force exerted by the water on the diver is:

a) 4.12 kN

b) 2.06 kN

c) 1.37 kN

d) 3.05 kN

e) 5.4 kN

15 A rock of mass m is dropped to the ground from a height h . A second rock, with mass $2m$, is dropped from the same height. When the second rock strikes the ground, its kinetic energy

a) twice that of the first rock

b) four times that of the first rock

c) the same as that of the first rock.

d) half as much as that of the first rock.

e) impossible to determine