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S.1 TERM II PHYSICS HOLIDAY 2015
Mass, Weight and Density

Question 1

The mass of a rock on the Earth is 2.0 kg. What is the mass of the rock on the Moon?

A   1.7 kg

B   2.0 kg

C   3.4 kg

D   20 kg

Question 2

The mass of a rock on the Earth is 2.0 kg. What is the weight of the rock on the Moon?

A   1.7 N

B   2.0 N

C   3.4 N

D   20 N

Question 3

The weight of a rock on the Earth is 20 N. What is the weight of the rock on the Moon?

A   2.0 N

B   3.4 N

C   12 N

D   20 N

Question 4

The weight of a rock on the Moon is 200 N. What is the mass of the rock on the Earth?

A   20 kg

B   118 kg

C   200 kg

D   1180 kg

Question 5

The weight of a rock on the Moon is 200 N. What is the weight of the rock on the Earth?

A   20 N

B   118 N

C   200 N

D   1180 N

Question 6

The weights of three objects measured on three celestial bodies are listed below. The weight of object A on the Moon is 200 N. The weight of object B on the Jupiter is 6000 N. The weight of object C on the Mercury is 400 N. Which of the following sequence shows the mass of the three objects in ascending order? (The acceleration due to gravity of the Moon, Jupiter and Mercury are 1.7 m s^{-2}, 25.4 m s^{-2} and 3.8 m s^{-2} respectively.)

A   object A, object B, object C

B   object C, object A, object B

C   object A, object C , object B

D   object B, object C, object A

Question 7

An astronaut of mass 80 kg jumped out of the rocket after it had landed on Jupiter. The astronaut took 0.40 s to drop for 2.0 m. What was the weight of the astronaut on Jupiter?

A   800 N

B   1000 N

C   1800 N

D   2000 N

Question 8

The following experiment was set up. Which of the following substances has the lowest density?

A   Air

B   Oil

C   Water

D   mercury

Question 9

The following experiment was set up. Which of the following is in ascending order of density?

A   water, mercury, oil

B   mercury, water, oil

C   oil, water, mercury

D   oil, mercury, water

Question 10

The following experiment was set up. Which of the following is a possible density for iron in kg m^{-3}?

A   600

B   1000

C   8000

D   14000

Question 11

Three objects are introduced into the same type of liquid as shown below. Which of the following is in descending (decreasing) order of density of the objects?

A   A, B, C

B   B, A, C

C   C, A, B

D   B, C, A

Question 12

When solid A of mass 2 g is immersed in a measuring cylinder filled with water, it displaces a volume of 4 cm³, What is the density of solid A?

A   0.5 g per cm cubed

B   2 g per cm cubed

C   5 N per cm cubed

D   20 N per cm cubed

Question 13

The figures below show the difference in water level before and after solid A is submerged in measuring cylinder. Given that solid A is 20 g, what is the density of solid A?

A   0.3 g per cm cubed

B   0.5 g per cm cubed

C   2 g per cm cubed

D   4 g per cm cubed

Question 14

In an attempt to find the density of a piece of floating object, the following measurements were carried out. Figure 1: Measuring cylinder with water. Figure 2: Measuring cylinder with water and a piece of stone submerged within. Figure 3: Measuring cylinder with water and a piece of stone tied to the floating object such that the floating object is also submerged under water. Given that the floating object has a mass of 3.0 g, what is its density?

A   0.23 g per cm cubed

B   0.43 g per cm cubed

C   0.50 g per cm cubed

D   3.50 g per cm cubed

Question 15

When solid A of mass 12 g is immersed in a measuring cylinder filled with water, it displaces the same volume of water as solid B of mass 8 g. What can be deduced about the densities of solids A and B?

A   Both A and B have the same density.

B   Density of A is 4 times density of B.

C   Density of A is 2/3 times density of B.

D   Density of A is 3/2 times density of B.

Question 16

In an attempt to find the average mass of an iron ball, the following measurements were carried out. Figure 1: Measuring cylinder with water. Figure 2: Measuring cylinder with water and 20 iron balls submerged within. Given that iron has a density of 7.5 g cm^{-3}, what is the mass of one iron ball?

A   1.87 g

B   5.25 g

C   16.9 g

D   105 g

Question 17

From the three diagrams below, find the density of the sand in g cm^{-3} given that the density of water is 1.0 g cm^{-3}

A   1.5

B   2.0

C   2.5

D   3.0

Question 18

From the four diagrams below, find the density of the sand in g cm^{-3} , given that the density of water is 1.0 g cm^{-3}.

A   1.5

B   2.0

C   2.5

D   3.0

Question 19

A bottle full of water has a mass of 200 g. When the same bottle is filled with liquid X, the mass becomes 180 g. If the mass of the empty bottle is 100 g, what is the density of liquid X in g cm^{-3}? (Take the density of water as 1.0 g cm^{-3})

A   0.2

B   0.8

C   0.9

D   1.2

Question 20

A wooden block of dimension 1 m X 1 m X 1 m has a mass of 800 kg. If Ashwin sawed half of the block away, what is the density of the remaining wooden block in kg m^{-3}?

A   200

B   400

C   800

D   1000

Question 21

A wooden block of dimension 1 m X 1 m X 1 m has a mass of 800 kg. Ajay attached a steel plate of dimension 1 m X 1 m X 0.02 m to the block. Given that the steel plate has a mass of 140 kg, what is the density of the combination in kg m^{-3}?

A   800

B   922

C   3900

D   7000

Question 22

5000 kg of iron is melted and mixed with 2.0 m^3 of molten copper. If the density of molten iron and molten copper are 7.5 g cm^{-3} and 9.0 g cm^{-3} respectively, what is the approximate density of the mixture?

A   7.5 g per cm cubed

B   8.3 kg per m cubed

C   8300 kg per m cubed

D   8600 kg per m cubed

Question 23

A 100 kg rock is being hung freely on the Moon. When an astronaut pushes the rock upwards, he will feel that

A   the rock is easier to be pushed than on Earth.

B   the rock is more difficult to be pushed as it is on Earth.

C   the rock requires as much effort to be pushed as on Earth.

D   the rock requires no effort to be pushed.

Question 24

A 100 kg rock is being hung freely on the Moon. When an astronaut pushes the rock from the side, he will feel that

A   the rock is easier to push that on the Earth.

B   the rock is more difficult to push that on the Earth.

C   the rock requires the same effort to be pushed as on the Earth.

D   the rock requires no effort to be pushed.

Question 25

When an astronaut jumps on the Moon (given that the acceleration due to gravity of the Earth and the Moon is 10 m s^{-2} and 1.7 m s^{-2} respectively).

A   He will take a longer time to reach the top and a longer time to come down as compared to jumping on the Earth.

B   He will take a longer time to reach the top and a shorter time to come down as compared to jumping on the Earth.

C   He will take a shorter time to reach the top and a longer time to come down as compared to jumping on the Earth.

D   He will take a shorter time to reach the top and a shorter time to come down as compared to jumping on the Earth.

Question 26

An astronaut in space wants to compare the mass of two balls. He holds the two balls in each of his hands and moves both hands up and down slightly for a few times. What is the reason for doing so.

A   He is trying to compare the inertia of the two balls. The one with a higher mass tends to be more difficult to be moved and to be stopped.

B	He is trying to compare the inertia of the two balls. The one with a higher mass tends to be easier to be moved and to be stopped.
C	He is trying to compare the weight of the two balls. The one with a higher weight tends to be more difficult to be moved and to be stopped.
D	He is trying to compare the weight of the two balls. The one with a higher weight tends to be easier to be moved and to be stopped.

END