NAME…… STREAM……..

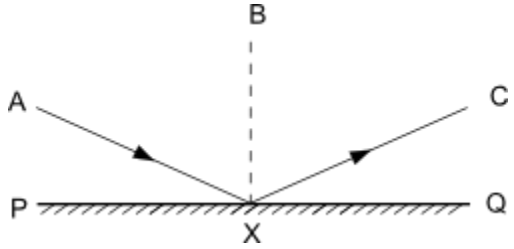
S.2 TERM II PHYSICS HOLIDAY 2015

Light

- **Circle the right answer.**

Question 1

From the diagram below, given that PQ is a plane mirror, which is the normal?



A AX

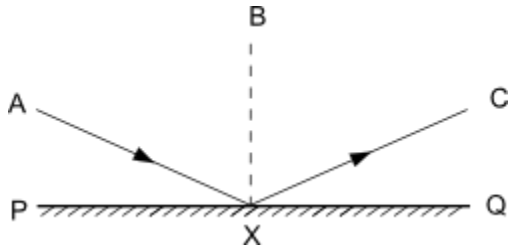
B BX

C XC

D AC

Question 2

From the diagram below, given that PQ is a plane mirror, which are the incident ray and the angle of incidence?



A Incident ray Angle of Incidence AX AXP

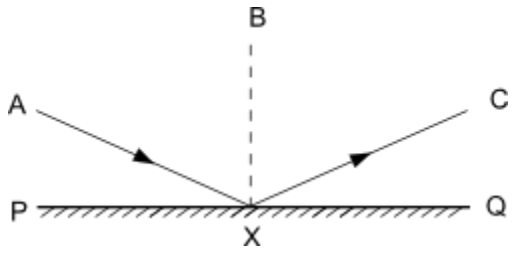
B AX AXB

C XC BXC

D XC CXQ

Question 3

From the diagram below, given that PQ is a plane mirror, which is the reflected ray and the angle of reflection?



A Reflected ray Angle of reflection AX AXP

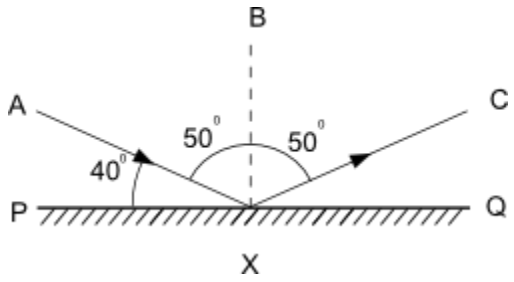
B AX AXB

C XC BXC

D XC CXQ

Question 4

From the diagram below, what is the angle of incidence?



A 40^0

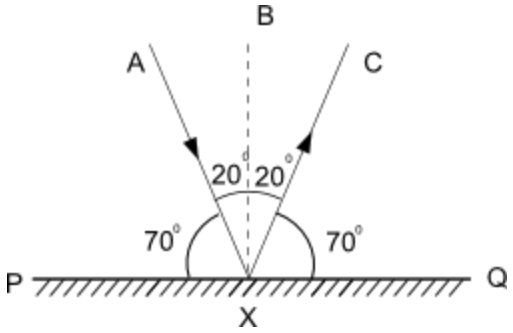
B 50^0

C 80^0

D 90^0

Question 5

From the diagram below, what is the angle of reflection?



A 20^0

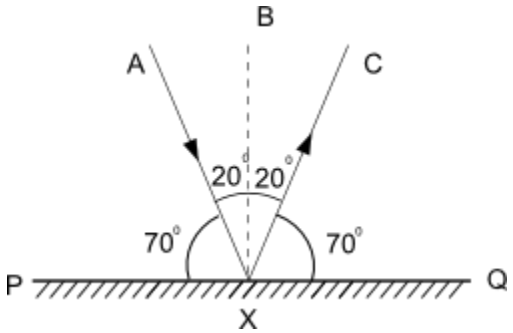
B 40^0

C 70^0

D 90^0

Question 6

From the diagram below, what is the angle between the incident ray and the reflected ray?



A 20^0

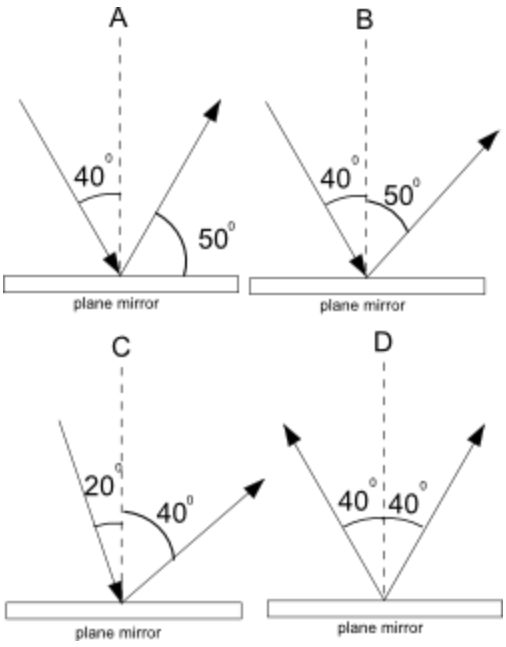
B 40^0

C 70^0

D 90^0

Question 7

Which of the following demonstrates the law of reflection?



A A

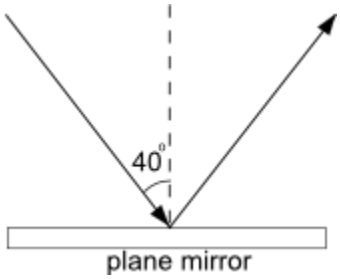
B B

C C

D D

Question 8

An incident ray strikes a plane mirror at an angle of incidence of 40^{o}. What is the decrease in the angle of reflection if the incident ray moves to an angle of incidence of 30^{o}?



A 10^{0}

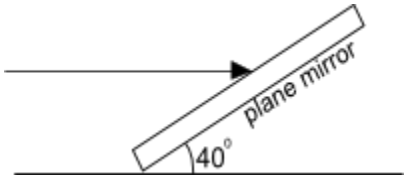
B 20^{0}

C 30^{0}

D 40^{0}

Question 9

A plane mirror is inclined at 40^{o} to the floor. An incident ray parallel to the floor strikes the mirror and a reflected ray is formed. What is the angle of reflection?



A 20^{0}

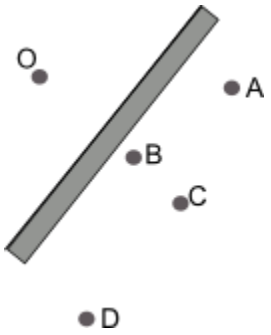
B 40^{0}

C 50^{0}

D 80^{0}

Question 10

An object O is placed in front of a mirror. Which is a possible position of the image?



A A

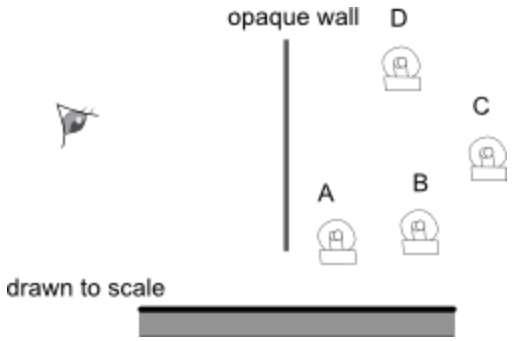
B B

C C

D D

Question 11

Four light bulbs are concealed from an observer by an opaque wall as shown. Without shifting the positions of the observer and the bulbs, how many bulbs can the observer see from the mirror?



A 1

B 2

C 3

D 4

Question 12

Which of the following are the properties of a plane mirror image?

1. The image is the same size as the object.
2. The image is virtual.
3. The image is inverted.

A 1 only

B 1 and 2 only

C 1 and 3 only

D 1, 2 and 3

Question 13

Which of the following are the properties of a plane mirror image?

1. The image is at the same distance as the object.
2. The image is upright.
3. The image is laterally inverted.

A 1 only

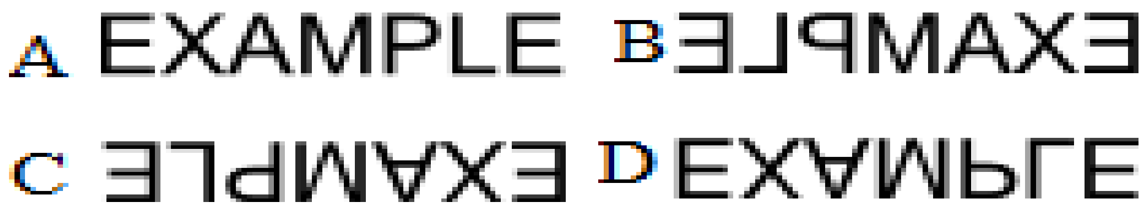
B 1 and 2 only

C 2 and 3 only

D 1, 2 and 3

Question 14

Which of the following is the mirror image of the word "EXAMPLE" when it is placed facing the plane mirror?



A A

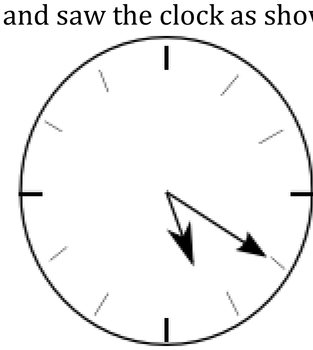
B B

C C

D D

Question 15

A man looked into a plane mirror and saw the clock as shown below. What was the time then?



A 5 : 20

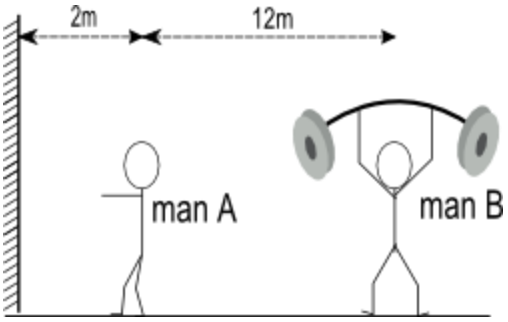
B 6 : 40

C 11 : 50

D 12 : 10

Question 16

Two men are standing in front of a plane mirror as shown. When a man looks into the mirror, how far away from him will man B seem to be?



A 12 m

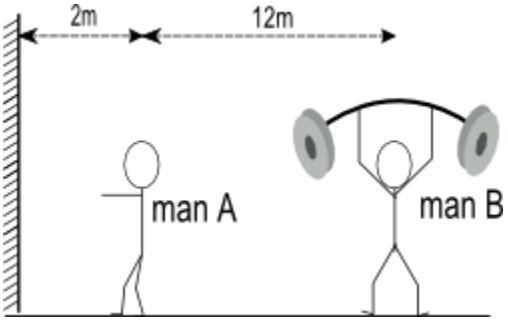
B 16 m

C 26 m

D 28 m

Question 17

Two men are standing in front of a plane mirror as shown. If man A walks 5 m backward and then looks into the mirror, how far away from him will man B seem to be?



A 7 m

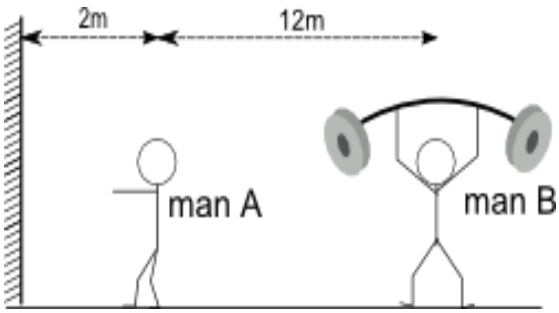
B 16 m

C 21 m

D 26 m

Question 18

Two men are standing in front of a plane mirror as shown. If man B walks 5 m backward and then looks into the mirror, how far away from him will man B seem to be?



A 9 m

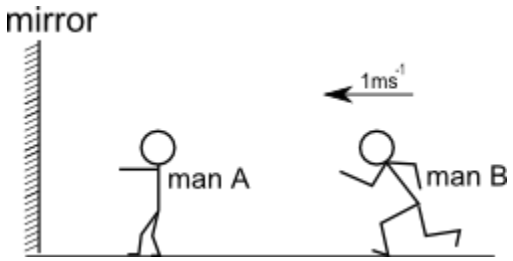
B 11 m

C 18 m

D 23 m

Question 19

Man A is standing in front of a plane mirror while man B is running towards him from behind. If man B is running at a speed of 1 m/s, how many meters nearer does man B seem to be away from man A after 5 seconds?



A 1 m

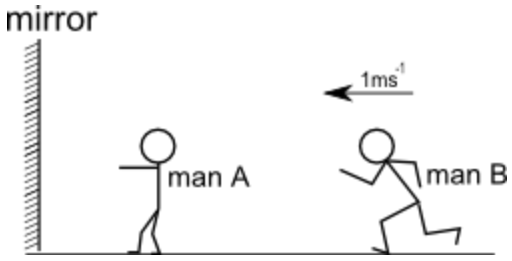
B 5 m

C 6 m

D 10 m

Question 20

Man A is facing a plane mirror while man B is running towards him from behind. If man B is running at a speed of 2 m/s, how fast does man B seem to be running towards man A?



A 1 m/s

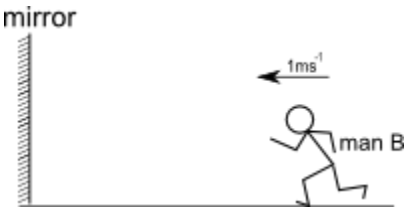
B 2 m/s

C 3 m/s

D 4 m/s

Question 21

A man is running towards a plane mirror at a speed of 2 m/s. How fast does he see himself running towards his image?



A 1 m/s

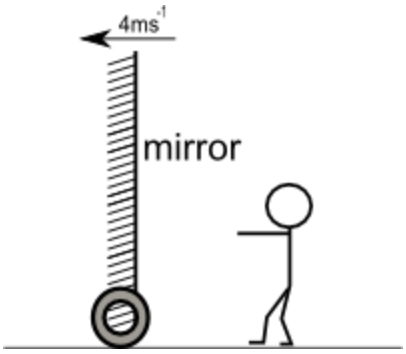
B 2 m/s

C 3 m/s

D 4 m/s

Question 22

A man is standing still while a plane mirror is moving away from him at a speed of 4 m/s, how fast does he see his image moving away?



A 1 m/s

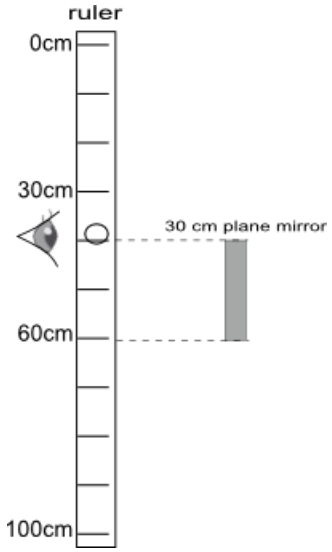
B 2 m/s

C 4 m/s

D 8 m/s

Question 23

A man drills a tiny hole at the 40 cm mark of a meter long ruler. He places a 30 cm long plane mirror in front of the ruler as shown. What are the minimum and maximum readings he can read from the image of the ruler if he peeps through the tiny hole looking into the plane mirror?



A Minimum Maximum reading 20 cm 70 cm

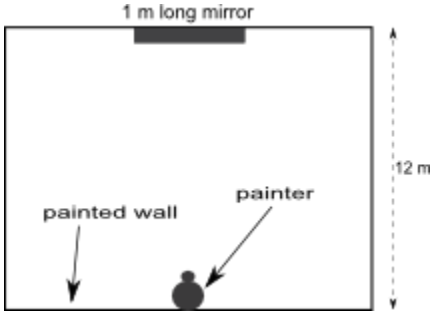
B 20 cm 80 cm

C 30 cm 60 cm

D 30 cm 80 cm

Question 24

A painter leans back against a pointed wall while looking into a 1 m long mirror at the opposite end of a rectangular room. How much of the painted wall can he see through the 1 m long mirror?



A 1 m

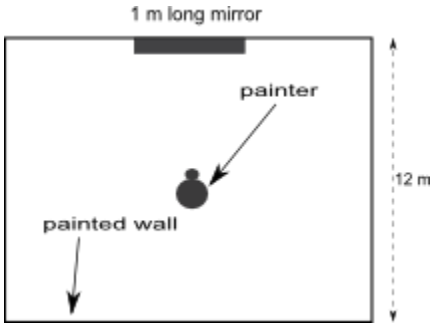
B 2 m

C 6 m

D 12 m

Question 25

A painter standing at the Centre of a rectangular room looking into a 1 m long mirror at the opposite end of the room. How much of the painted wall can he see through the 1 m long mirror?



A 1 m

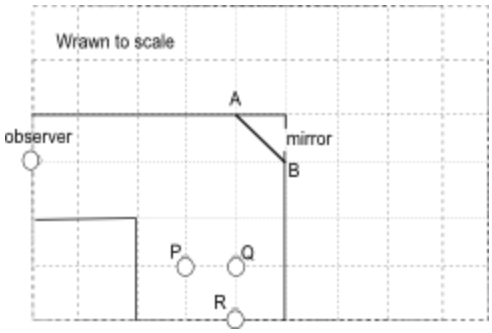
B 2 m

C 3 m

D 6 m

Question 26

A plane mirror AB is positioned at the corner of a road as shown in the plan view below. Which men can the observer see through mirror?



A P and Q only

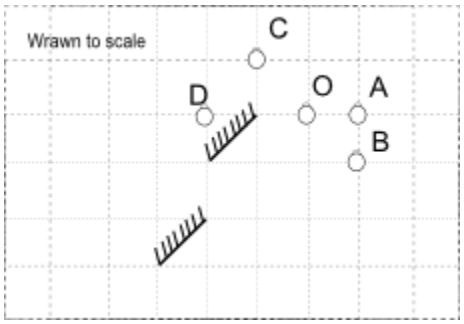
B P and R only

C Q and R only

D P, Q and R

Question 27

Two mirrors (facing each other) and an object O are places in the grid as shown. At which position(s) can the virtual image of object O be formed?



A C only

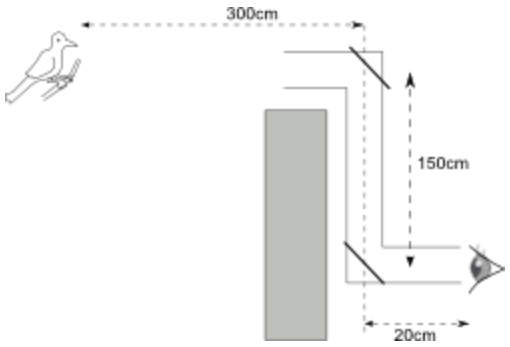
B D only

C A and B only

D B and C only

Question 28

A mirror periscope is used to observe a bird as shown below. How far away will the bird seem to be from the observer?



A 320 cm

B 470 cm

C 620 cm

D 940 cm

Mass, Weight and Density

Question 29

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 30

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 31

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 32

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 33

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 34

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 35

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 36

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

A Air

B Oil

C Water

D Mercury

Question 37

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 38

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 39

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 40

When solid A of mass 2 g is immersed in a measuring cylinder filled with water, it displaces a volume of 4 cm^3, 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 41

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 42

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 43

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 44

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 45

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 46

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 47

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 48

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 49

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 50

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 51

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 52

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 53

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