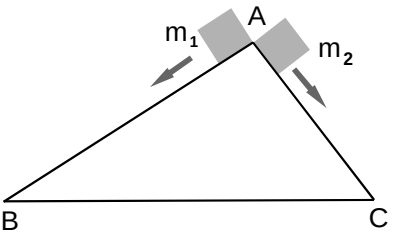
PHYSICS

Two blocks of unequal masses m_1 and m_2 slide from rest down two smooth inclined planes AB and AC respectively, as shown.



Let υ_B and υ_C be the speeds of the blocks at B and C, respectively and t_B and t_C the corresponding transit times, then

A $\upsilon_B > \upsilon_C$ and $t_B < t_C$

B $\upsilon_B < \upsilon_C$ and $t_B > t_C$

C $\upsilon_B = \upsilon_C$ and $t_B > t_C$

D $\upsilon_B = \upsilon_C$ and $t_B = t_C$

Three forces F_1, F_2 and F_3 act on an object keeping it in equilibrium. The forces must be

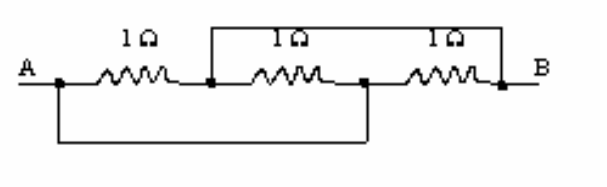
A normal to each other
B coplanar
C of equal magnitude
D of random orientation

A disc of cork floating on water dips by 5 mm when a lump of metal of negligible volume is placed on its top surface. If the same lump of metal is attached to its bottom surface, the disc will dip

A by 5 mm
B by less than 5 mm
C by greater than 5mm but not completely
D completely

If the latitude of a place is 30°, the pole star will be seen at an altitude of

A 30° **B** 0° **C** 90° **D** 60°



The effective resistance of the above circuit is

A 1 Ω **B** 3 Ω **C** 1/3 Ω **D** 1/2 Ω

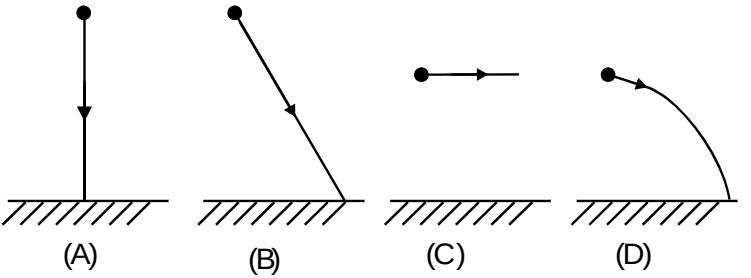
Sunlight filters through the leaves of a banyan tree and makes small patterns of light on the largely shaded area on the ground under the tree. The shapes of these lighted spots are

A triangular **B** square **C** irregular **D** circular

Pure ice and sodium chloride crystals are good insulators. When they are melted,

A sodium chloride becomes a good conductor, while ice remains an insulator
B both remain insulators
C ice becomes a good conductor while sodium remains an insulator
D both become good conductors

The bob of an oscillating pendulum gets detached (the string breaks) when the pendulum is at its mean position. Its possible trajectory is as shown in figure



A (A) **B** (B) **C** (C) **D** (D)

Measurement of two masses is reported as 14.8 g and 8.04 g. The difference between them should be reported as

A 6.76 g **B** 6.80 g **C** 6.8 g **D** 7 g


ARYAN

In a glass prism of refractive index 1.5,

A the speed of red light is less than that of violet light.
B the speed of red light is more than that of the violet light.
C the speed of the violet light is 1.5 times that of the red light.
D the speeds of both red and violet light are identical.

CHEMISTRY

Preparation of ethene by the action of H_2SO_4 on C_2H_5OH is an example of

A elimination
B oxidation
C condensation
D reduction

$CH_3CH(CH_3)CH_2CH_3$ is isomeric with

A $CH_3CH_2CH(CH_3)CH_3$
B $C(CH_3)_4$
C $CH_3CH_2CH_2CH(CH_3)CH_3$
D $CH_3CH{=}C(CH_3)_2$

$CaCO_3$ (at. Wt. of Ca = 40 amu, C = 12 amu, O = 16 amu) when heated produces lime. The amount of lime produced from 10 tons of $CaCO_3$ is

A 6.4 tons **B** 4.4 tons **C** 3.6 tons **D** 5.6 tons

Generally, separation of two solids from the same solution can be achieved by

A chromatography
B filtration
C evaporation
D distillation

1 g each of Ca, K, Na, and Mg is allowed to react with water to produce hydrogen. The metal that produces largest quantity of hydrogen is

A Ca **B** Na **C** K **D** Mg

The pair of electrodes that will give the highest voltage among Cu/Mg, Cu/Zn, Ag/Mg, Mg/Al is

A Cu/Mg **B** Cu/Zn **C** Ag/Mg **D** Mg/Al

Amongst the compounds CaO, CO_2, PbO, and SnO_2, the acidic oxide is

A CaO **B** PbO **C** SnO_2 **D** CO_2

If the pH of a solution changes from 6 to 4, the hydrogen ion concentration will

A decrease to $1/100^{th}$ of the original value
B decrease to ½ of the original value
C increase by 100 fold
D double

CO_2, SO_2 and O_3 are associated respectively with

A green house effect, acid rain and skin cancer
B acid rain, green house effect and skin cancer
C green house effect, skin cancer and acid rain
D skin cancer, acid rain and green house effect

Alfred Nobel was associated with the discovery of

A noble gases
B noble metals
C TNT (trinitrotoluene)
D dynamite

BIOLOGY

Zoonotic viruses are those that ,

A can spread from one species of animals to another
B are confined to one species of animals
C spread from plants to animals
D infect only captive animals in zoos

Sericulture refers to

A culturing stem cells
B growing vegetables
C rearing silkworms
D breeding fishes

Fruits are normally ripened in the dark because,

A light causes rotting of fruits
B light promotes worm infestation
C ethylene production is reduced in the presence of light
D absence of light lowers temperature

In adult humans, red blood cells are produced in,

A bone marrow
B kidneys
C liver
D heart

Which one the following is not a species

A mule
B star fish
C mountain goat
D guinea pig

Which of the following can respire anerobically ?

A grass
B cactus
C mushrooms
D bakers Yeast

A family has five boys. What is the probability that their sixth child will be a girl ?

A 0
B 50 %
C 100 %
D Not predictable

Human immunodeficiency virus (HIV) is an RNA virus that can replicate in human T cells. Diagnosis of HIV infection is done by the detection of the presence of,

A viral RNA in blood
B viral proteins in blood
C virus specific antibodies in blood
D viral particles in blood

Your doctor has prescribed 40 tablets, to be taken one every half an hour. You start the first at 6.00 AM. When will you take the last one?

A 2.00 AM the next day
B 1.30 AM the next day
C 1.00 AM the next day
D 2.30 AM the next day

Transpiration will be the fastest when the day is,

A cool, humid and still
B hot, humid and still
C hot, humid and windy
D hot, dry and windy