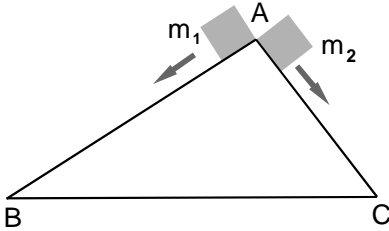


## PHYSICS

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  $v_B$  and  $v_C$  be the speeds of the blocks at B and C, respectively and  $t_B$  and  $t_C$  the corresponding transit times, then

- A  $v_B > v_C$  and  $t_B < t_C$
- B  $v_B < v_C$  and  $t_B > t_C$
- C  $v_B = v_C$  and  $t_B > t_C$
- D  $v_B = v_C$  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 5 mm but not completely
- D completely

If the latitude of a place is  $30^\circ$ , the pole star will be seen at an altitude of

- A  $30^\circ$
- B  $0^\circ$
- C  $90^\circ$
- D  $60^\circ$



The effective resistance of the above circuit is

- A**  $1\ \Omega$             **B**  $3\ \Omega$             **C**  $1/3\ \Omega$             **D**  $1/2\ \Omega$

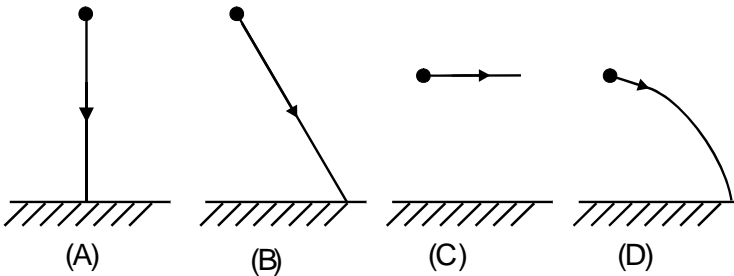
Sunlight filters through the leaves of a banyan tree and makes small patterns of light on the largely shaded area on the ground under the tree. The shapes of these lighted spots are

- 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

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  $\text{H}_2\text{SO}_4$  on  $\text{C}_2\text{H}_5\text{OH}$  is an example of

- A elimination
- B oxidation
- C condensation
- D reduction

$\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$  is isomeric with

- A  $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_3$
- B  $\text{C}(\text{CH}_3)_4$
- C  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_3$
- D  $\text{CH}_3\text{CH}=\text{C}(\text{CH}_3)_2$

$\text{CaCO}_3$  (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  $\text{CaCO}_3$  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  $\text{CaO}$ ,  $\text{CO}_2$ ,  $\text{PbO}$ , and  $\text{SnO}_2$ , the acidic oxide is

- A  $\text{CaO}$
- B  $\text{PbO}$
- C  $\text{SnO}_2$
- D  $\text{CO}_2$

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

- A decrease to  $1/100^{\text{th}}$  of the original value
- B decrease to  $1/2$  of the original value
- C increase by 100 fold
- D double

CO<sub>2</sub>, SO<sub>2</sub> and O<sub>3</sub> 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





ARYAN