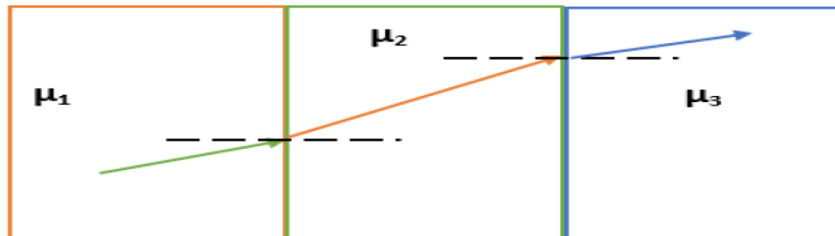


SAMPLE QUESTION PAPER

PHYSICS

In the following diagram, there are three materials of different refractive index (μ) and headed arrows indicates path travelled by ray of light.



Find the correct relation for the refractive index (μ):

- a. $\mu_1 < \mu_2 > \mu_3$
- b. $\mu_1 < \mu_2 < \mu_3$
- c. $\mu_1 > \mu_2 < \mu_3$
- d. $\mu_1 > \mu_2 > \mu_3$

A student is using “Fleming left hand rule” to find the “direction of induced current” in “electric generator”, his friend suggest him to use “right hand thumb rule” to find “direction of magnetic field first” and then use it to find direction of current. The correct method to find direction of induced current is:

- a. Fleming left hand rule + Right hand thumb rule.
- b. Ohms Law + Fleming right hand rule.
- c. Right hand thumb rule + Fleming right hand rule.
- d. Fleming right hand rule only.

You have a voltmeter with high resistance and an ammeter with low resistance. What happens if you accidentally connect the voltmeter in series and the ammeter in parallel in a circuit?

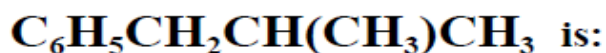
- a. Both instruments will function normally.
- b. The voltmeter will read zero, and the ammeter may be damaged.
- c. The voltmeter will be damaged, and the ammeter will read zero.
- d. The circuit will stop working altogether.

CHEMISTRY

Which property distinguishes alkali metals from alkaline earth metals ?

- a. Alkali metals form covalent oxides.
- b. Alkali metals have higher melting points than alkaline earth metals.
- c. Alkali metals react more vigorously with water than alkaline earth metals.
- d. Alkali metals are less dense than alkaline earth metals.

The IUPAC name of the compound with the molecular formula



- a. 1-Methyl-2-phenylpropane
- b. 2-Methyl-1-phenylpropane
- c. 1-Phenyl-2-methylpropane
- d. 2-Phenyl-2-methylpropane

The compound that exhibits both geometrical and optical isomerism is:

- a. But-2-ene
- b. 2-Chlorobutane
- c. 2,3-Dichlorobutane
- d. 2-Pentene

How many moles of H_2SO_4 are required to completely react with 5 moles of NaOH?



- a. 2.5 moles
- b. 5 moles
- c. 10 moles
- d. 1.25 moles

MATHEMATICS

A ball is thrown from the top of the table,
time taken by the ball & it's height from the ground is given by below equation

$$\text{height} = -5t^2 + 15t + 20$$

After how much time it will reach the ground?

- (a) 1
- (b) -1
- (c) 3
- (d) 4

A cone of height 7cm is placed on a hemisphere of radius 7cm.
What is the total volume of the solid? (Use $\pi = \frac{22}{7}$).

- (a) $789 m^3$
- (b) $719m^3$
- (c) $359m^3$
- (d) $1078 cm^3$

Consider the quadratic equation $x^2 - 5x + 6 = 0$. Match the following statements:

- 1: The roots are integers.
- 2: The product of roots is 6.
- 3: The roots are -3 and 2.
- 4: The sum of roots is -5.

Correct answers:

- (a) 1 & 2 only
- (b) 1 & 4 only
- (c) 2 & 3 only
- (d) 1 & 3 only

From the top of a building, an observer looks at a car parked at some distance away and makes an angle of depression of 45° . If the height of the building is 50m, find how far the car is from the building?

- (a) 45m
- (b) 50m
- (c) 30m
- (d) 60cm

BIOLOGY

What is the primary mechanism by which cells regulate their internal environment despite changes in the external environment?

- a. Homeostasis
- b. Osmosis
- c. Diffusion
- d. Active transport

Which of the following is the example of genetic variation?

- a. One person has a scar but it's friend doesn't
- b. One person is older than other
- c. Two children have different eye colour
- d. None of the above

Which process involves the breakdown of glucose to produce energy in the form of ATP?

- a. Photosynthesis
- b. Respiration
- c. Fermentation
- d. Glycolysis

Which process involves the movement of genes from one population to another through the migration of individuals?

- a. Gene flow
- b. Genetic drift
- c. Mutation
- d. Natural selection

LOGICAL REASONING

If VICTORY is coded as YLFWRUB, how can SUCCESS be coded ?

- A. VXEEIVV B. VYEFIVV C. VXFFHVV D. None of these

If - means $\times$, $\times$ means $+$, $+$ means $\div$ and $\div$ means $-$, then $40 \times 12 + 3 - 6 \div 60 = ?$

- A. 7.95 B. 16 C. 44 D. 4

Arrange the given words in a meaningful sequence

1. Site 2. Plan 3. Rent 4. Money 5. Building

- A. 4,1,2,5,3 B. 3,4,2,5,1 C. 2,3,5,1,4 D. 1,2,3,5,4

A group of 1200 persons consisting of captains and soldiers is travelling in a train. For every 15 soldiers there is one captain. The number of captains in the group is?

- A. 85 B. 80 C. 75 D. 70