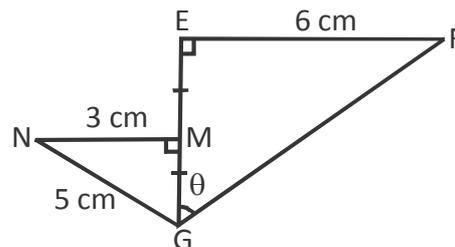
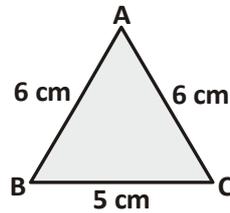


1. Identify the correct statement.
- (A) The roots of the quadratic equation  $2y^2 + 9y = 0$  are 0 and  $\frac{9}{2}$
- (B) The value of 'k' for which  $4m^2 + k - 15 = 0$  has a root  $m = 3$  is 7.
- (C) The quadratic equation  $(4x - 11)^2 = 0$  has two distinct roots.
- (D)  $7x^2 - 12x - 18 = 0$  is not a quadratic equation.
2. There are 19 hockey players in a club. On a particular day 14 were wearing the prescribed hockey shirts, while 11 were wearing the prescribed hockey pants. None of them was without hockey pant or hockey shirt. How many of them were in complete hockey uniform ?
- (A) 8      (B) 6      (C) 9      (D) 7
3. In the given figure, EMG is a straight line. Find the value of  $\cos \theta$ .

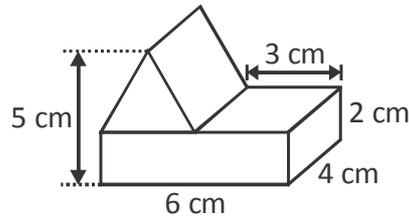


- (A) 0.9      (B) 0.8      (C) 0.6      (D) 0.7

4. The figure shows an isosceles triangle ABC. Find the length of the perpendicular from A to BC.

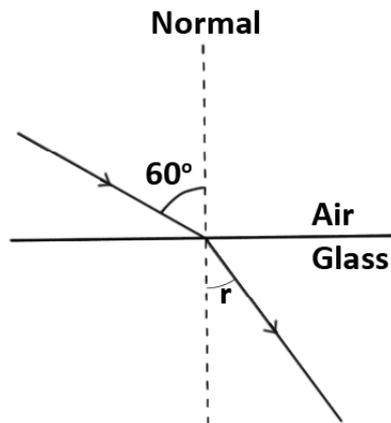


- (A) 5.45 cm                      (B) 4.55 cm  
(C) 5.6 cm                        (D) 4.54 cm
5. A triangular prism is placed on a rectangular prism, as shown. Find the volume of the combined structure.



- (A)  $76 \text{ cm}^3$                       (B)  $66 \text{ cm}^3$   
(C)  $72 \text{ cm}^3$                       (D)  $84 \text{ cm}^3$

6. Which of these is the main disadvantage of using nuclear power ?
- (A) High risk of explosion  
 (B) Produces vast amounts of energy  
 (C) Sustainable source of energy  
 (D) Radioactive wastes remain radioactive for thousands of years.
7. A ray of light travels from air to glass as shown below.



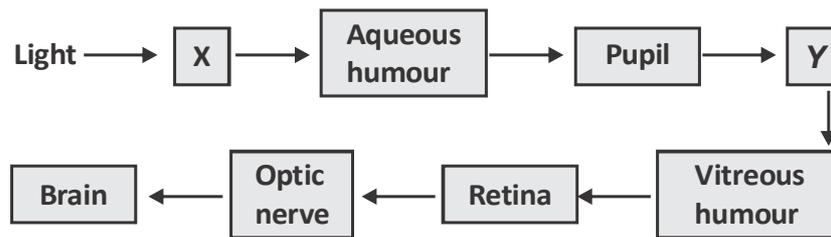
Given that the refractive index of air is 1.0 and the refractive index of glass is 1.5, what is the angle of refraction ?

- (A)  $22.6^\circ$     (B)  $30.8^\circ$     (C)  $35.3^\circ$     (D)  $40.0^\circ$
8. Only one of the following applies to a concave lens. Identify it.
- (A) The focal length is positive.  
 (B) The object distance can be positive or negative.  
 (C) The height of the image can be positive or negative.  
 (D) Image distance is always negative.

9. Velocity of light in water, glass and vacuum have the values  $V_w$ ,  $V_g$  and  $V_c$  respectively. Which of the following relations is true ?

- (A)  $V_w = V_g = V_c$                       (B)  $V_w > V_g$  but  $V_w < V_c$   
 (C)  $V_w = V_g$  but  $V_w < V_c$             (D)  $V_c > V_w$  but  $V_w < V_g$

10. The path taken by light as it enters our eye is shown below.



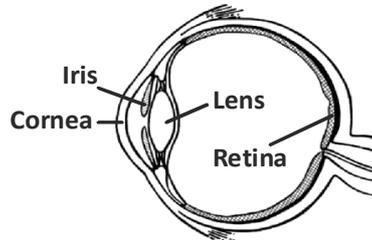
Identify the parts X and Y.

- (A) Cornea, Lens  
 (B) Blindspot, Ciliary muscles  
 (C) Sclera, Choroid  
 (D) Lens, Suspensory ligaments

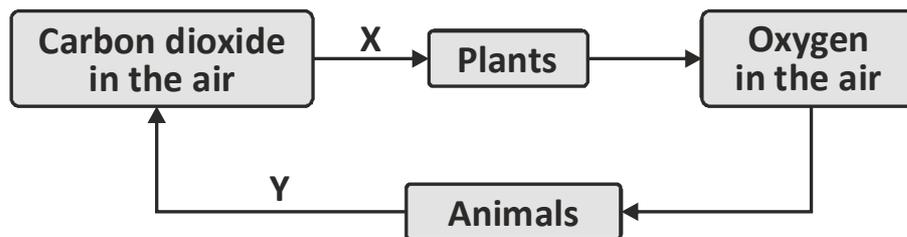
- 11. Magnesium is not extracted using the reduction method by carbon because**
- (A) the extraction process is slow.
  - (B) the magnesium obtained is less pure.
  - (C) magnesium is more reactive than carbon.
  - (D) the reduction process requires a very high temperature and pressure.
- 12. The reaction between hydrochloric acid and sodium hydroxide releases more heat energy than the reaction between ethanoic acid and sodium hydroxide. What is the reason for this difference in heat energy released ?**
- (A) Less heat energy is released due to less water formed.
  - (B) More heat energy is released due to more water formed.
  - (C) Some heat energy is absorbed for the dissociation of ethanoic acid molecules to form hydrogen ions.
  - (D) More heat energy is released due to the dissociation of ethanoic acid molecules to form hydrogen ions.
- 13. In a neutralisation reaction, sodium hydroxide is neutralised by sulfuric acid. What would be the products of this neutralisation ?**
- |                           |                          |
|---------------------------|--------------------------|
| <b>1. Hydrogen</b>        | <b>2. Water</b>          |
| <b>3. Sodium Chloride</b> | <b>4. Sodium sulfate</b> |
- (A) 1 and 3
  - (B) 2 and 3
  - (C) 2 and 4
  - (D) 1,2 and 4

- 14. An unbalanced chemical equation has number of atoms of elements are that**
- (A) less on the left side of the equation.
  - (B) more on the right side of the equation.
  - (C) equal on both sides of the equation.
  - (D) both (A) and (B)
- 15. The three elements calcium, strontium and barium form a triad. What is the basis of this grouping ?**
- i) Elements are in the increasing order of their atomic weights.**
  - ii) The atomic weight of the middle element is equal to the average of the atomic weight of extreme elements.**
  - iii) Elements in a triad have similar chemical properties.**
- (A) Only (i) and (ii)                      (B) Only (ii) and (iii)  
(C) Only (i) and (iii)                      (D) (i), (ii) and (iii)

16. In which labelled part of the human eye images are formed ?

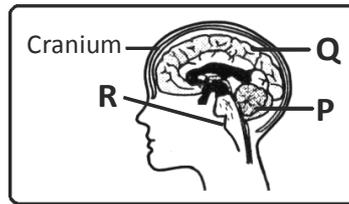


- (A) Iris      (B) Cornea      (C) Lens      (D) Retina
17. The figure shows the balance of oxygen and carbon dioxide in the air through plants and animals. Which process represents X and Y ?



- (A) X - Respiration, Y - Transpiration  
 (B) X - Transpiration, Y - Photosynthesis  
 (C) X - Respiration, Y - Photosynthesis  
 (D) X - Photosynthesis, Y - Respiration
18. What happens to the pollen grains after pollination ?
- (A) Pollen grow grains into a new plant.  
 (B) Pollen grains germinate on stigma.  
 (C) Pollen grain germinate on petal.  
 (D) Pollen grain develop into a fruit.

19. What will happen if part 'R' is injured ?



- (A) Breathing will be affected.
  - (B) The person will not be able to think rationally.
  - (C) Coordination and stability of the body will be adversely affected.
  - (D) The person will not be able to see.
20. What is the importance of having many blood vessels in the walls of the small intestine ?
- (A) The blood vessels absorb water from undigested food.
  - (B) The blood vessels carry the digestive juices to the digestive system.
  - (C) The blood vessels enable absorption of digested food to take place efficiently.
  - (D) The blood vessels allow food to enter the bloodstream and be completely digested in the blood.

- 21. A situation/statement is given below followed by four options. Choose the best reason.**

**Burns caused by steam are more severe than those caused by boiling water because**

- (A) steam pierces through the skin quickly.
  - (B) temperature of steam is higher than that of boiling water.
  - (C) steam is gas and penetrates the body rapidly.
  - (D) steam has latent heat which is not present in boiling water.
- 22. A meteorological report shows the following records of a certain number of days.**

It rained 10 times, either in the morning or in the afternoon.  
There were 8 dry afternoons.  
There were 14 dry mornings.  
Each wet afternoon was preceded by a dry morning.

**How many days did the meteorologist record ?**

- (A) 14 days
  - (B) 16 days
  - (C) 18 days
  - (D) 32 days
- 23. A box has 16 candies: 12 red and 4 yellow. If you were picking candies from the box without looking, how many candies would you have to pick up to be certain to find two of the same colour ?**
- (A) 01
  - (B) 02
  - (C) 03
  - (D) 04

24. You have a special clock that produces a beautiful tune everytime the hour hand and minute hand meet each other. How many times in a day do you expect the tune to be played ?

- (A) 22      (B) 23      (C) 24      (D) 25

25. “You must submit your application within 10 days from the date of release of this advertisement.” What is the exact date before which the application must be submitted ?

**Statement I: The advertisement was released on 18<sup>th</sup> February.**

**Statement II: It was a leap year.**

- (A) Statement I alone is sufficient, but statement II alone is not sufficient
- (B) Statement II alone is sufficient, but statement I alone is not sufficient
- (C) Both statements together are sufficient, but neither statement alone is sufficient
- (D) Statements I and II together are not sufficient