

Term I - Full Syllabus Test

Subject: Science

Time: 01:30 hrs

Instructions:

- The question paper contains three sections.
- Section A (**1 - 24**) has 24 questions. Attempt any 20 questions.
- Section B (**25 - 48**) has 24 questions. Attempt any 20 questions.
- Section C (**49 - 60**) has 12 questions based on three case studies. Attempt any 10 questions.
- All questions carry equal marks.
- There is no negative marking.

1. Which of the following represent a double displacement reaction?

- A.** $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l})$
- B.** $2\text{Mg}(\text{s}) + \text{O}_2(\text{g}) \rightarrow 2\text{MgO}(\text{s})$
- C.** $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{AgCl}(\text{s}) + \text{NaNO}_3(\text{aq})$
- D.** $2\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl}(\text{g})$

2. The absolute refractive index of a medium with respect to air is given by :

[c = speed of light in air, v = speed of light in the medium]

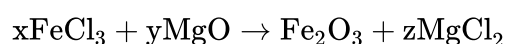
- A.** $n_m = \frac{c^2}{v}$
- B.** $n_m = \frac{v}{c}$
- C.** $n_m = \frac{c}{v}$
- D.** None of above

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3. The number of water of crystallization molecules present in one molecule of plaster of Paris is:

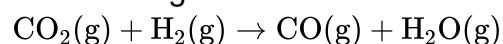
A. 4.0
B. 0.5
C. 0.2
D. 1.0

4. What will be the values of the coefficients x, y and z if the given reaction is balanced?



A. $x = 2, y = 3, z = 3$
B. $x = 2, y = 4, z = 3$
C. $x = 3, y = 2, z = 2$
D. $x = 3, y = 2, z = 3$

5. Determine which substance is oxidized and which substance is reduced in the following reaction:



A. CO_2 is oxidized and H_2 is reduced.
B. CO_2 is reduced and H_2 is oxidized.
C. Both CO_2 and H_2 are reduced.
D. Both CO_2 and H_2 are oxidized.

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6. To form a virtual image twice the size of the object, using a convex lens of focal length, (f) 20 cm , the object distance (u) must be _____.
- A. $u < 20\text{ cm}$
 - B. $u > 40\text{ cm}$
 - C. $20\text{ cm} \leq u \leq 40\text{ cm}$
 - D. $u = 20\text{ cm}$
7. _____ is a phenomenon in which the fats and oils present in food get oxidised causing spoilage of food.
- A. Corrosion
 - B. Rancidity
 - C. Rusting
 - D. Decomposition
8. Sun appears to be risen before the actual sunrise because of:
- A. Scattering of light
 - B. Dispersion of light
 - C. Atmospheric refraction
 - D. Atmospheric reflection

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9. Which of the following are examples of chemical reactions?

- i. Burning of wood
- ii. Cutting of wood
- iii. Conversion of steam to water
- iv. Rusting of almirah

A. i, iv

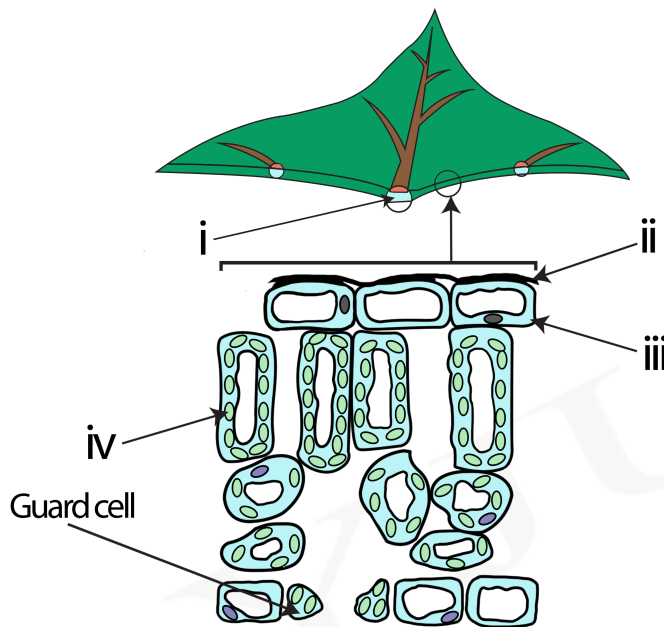
B. i, iii

C. ii, iv

D. ii, iii

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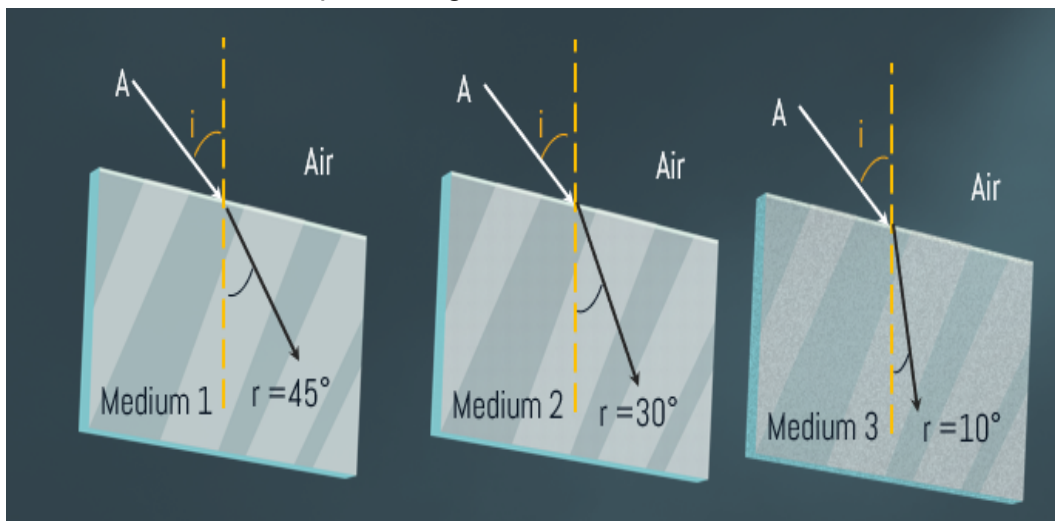
10. The image given below shows the cross section of a leaf with labels (i) to (iv). Identify the option that correctly identifies the structure and corresponding function.



- A. (i) Midrib: Attracts insects for pollination
- B. (ii) Lower epidermis: Protects from mechanical damage
- C. (iii) Waxy cuticle: Prevents loss of water
- D. (iv) Chloroplasts: A cell organelle that conducts photosynthesis

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11. A ray of light is incident on a set of media at an angle 60° . The angle of refraction is different for different media as shown.
In which medium the speed of light is slowest?



- A. Medium 1
 - B. Medium 2
 - C. Medium 3
 - D. Light will have same speed in all medium
12. The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance because among all other colours, the red light:
- A. is scattered the most by smoke or fog.
 - B. is scattered the least by smoke or fog.
 - C. is absorbed the most by smoke or fog.
 - D. Reflection of light from the earth.

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13. The instrument used for measuring blood pressure is:
- A. Manometer
 - B. Sphygmomanometer
 - C. Thermometer
 - D. Barometer
14. The phloem tissue in plants is responsible for the transport of:
- A. Water
 - B. Minerals
 - C. Food
 - D. All of the above
15. Which among the following is not a part of the alimentary canal?
- A. Stomach
 - B. Liver
 - C. Oesophagus
 - D. Rectum
16. Select the correct events that occur during inspiration.
- A. Diaphragm contracts
 - B. Diaphragm relaxes
 - C. Thoracic cavity volume decreases
 - D. Ribs and sternum return to the original position

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17. The exit of food from the stomach to the _____ is controlled by _____.

- A. oesophagus, epiglottis
- B. small intestine, sphincter muscle
- C. large intestine, sphincter muscle
- D. colon, anal sphincter

18. Match the chambers of the human heart in Column A to its function in Column B.

<i>Column A</i>	<i>Column B</i>
<i>(i) Right atrium</i>	<i>(a) Pumps deoxygenated blood to lungs</i>
<i>(ii) Left atrium</i>	<i>(b) Receives oxygenated blood from lungs</i>
<i>(iii) Right ventricle</i>	<i>(c) Pumps oxygenated blood to the body</i>
<i>(iv) Left ventricle</i>	<i>(d) Receives deoxygenated blood from the body</i>

- A. (i) - (b), (ii) - (d), (iii) - (c), (iv) - (a)
- B. (i) - (b), (ii) - (d), (iii) - (a), (iv) - (c)
- C. (i) - (d), (ii) - (b), (iii) - (c), (iv) - (a)
- D. (i) - (d), (ii) - (b), (iii) - (a), (iv) - (c)

19. Which of the following compounds cannot be used as an antacid during acid indigestion?

- A. $Mg(OH)_2$
- B. $Al(OH)_3$
- C. $NaHCO_3$
- D. $NaOH$

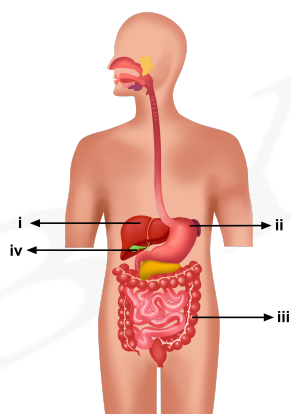
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20. Arrange the given compounds in the decreasing order of their pH.

$NaCl$, $NaOH$, CH_3COOH , H_2SO_4

- A. $NaCl > NaOH > CH_3COOH > H_2SO_4$
- B. $H_2SO_4 > CH_3COOH > NaCl > NaOH$
- C. $NaOH > CH_3COOH > H_2SO_4 > NaCl$
- D. $NaOH > NaCl > CH_3COOH > H_2SO_4$

21. Observe the diagram of the human digestive system. The labels (i) to (iv) represent the different parts of the digestive system. Match the correct part of the digestive system in column I to its corresponding function in column II.

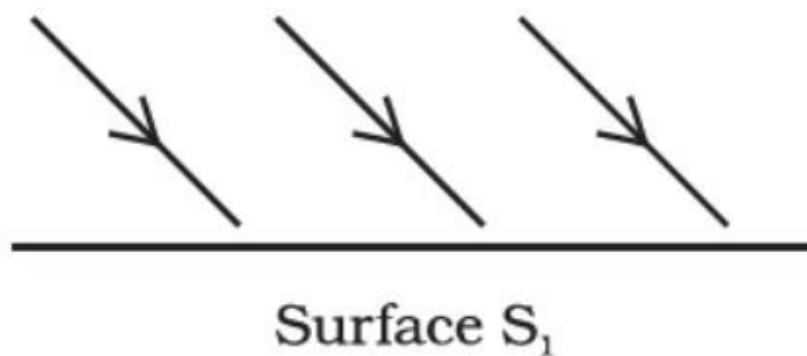


Column I	Column II
i	a) Increases the efficiency of lipase enzyme action
ii	b) Responsible for absorption of more water from undigested food
iii	c) Stores bile
iv	d) Digestion of food is taken care of by gastric glands present here

- A. i - c) ; ii - b) ; iii - d) ; iv- a)
- B. i - a) ; ii - d) ; iii - b) ; iv- c)
- C. i - c) ; ii - a) ; iii - d) ; iv- a)
- D. i - d) ; ii - a) ; iii - c) ; iv- b)

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22. The light rays are falling on surfaces S_1 , S_2 , S_3 as shown in the figures.



The surfaces on which the angle of incidence will be equal to the angle of reflection is/are:

- A. Only S_1
- B. S_1 and S_2 only
- C. S_2 and S_3 only
- D. All the three surfaces

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23. Light is incident on a transparent plastic block at an angle of 45° from air. The speed of light in the plastic is $\frac{c}{\sqrt{2}}$, where c is the speed of light in the vacuum. Find the angle of refraction.
- A. 30°
 - B. 60°
 - C. 75°
 - D. 45°
24. Concave mirror is used in which of the following case(s)?
1. Dentist mirror
 2. Rearview mirror
 3. Solar heater
 4. Torch reflector
- A. Only 1
 - B. 1 and 2
 - C. 1 and 3
 - D. 1, 3 and 4
25. An object of size 50 cm is placed 20 cm in front of a spherical mirror and its image of size 25 cm is formed above the principal axis. Find the focal length as per sign convention and the type of spherical mirror used here?
- A. -25 cm, concave mirror
 - B. -20 cm, concave mirror
 - C. $+25$ cm, convex mirror
 - D. $+20$ cm, convex mirror

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26. If the power of a lens is + 0.1 D and if an object of size 2 cm is placed 5 cm before the lens. Find the size and position of the image formed?
- Image size = 4 cm, image distance = – 10 cm
 - Image size = 10 cm, image distance = – 4 cm
 - Image size = 5 cm, image distance = 4 cm
 - Image size = 4 cm, image distance = 5 cm
27. To get her house whitewashed, an officer bought 10 kg of quicklime from the market and dissolved in 30 litres of water. She noticed that the water started boiling even when it was not being heated. Choose the corresponding product formed and the type of reaction involved.
- Product formed:- Limestone
Type of reaction:- Endothermic
 - Product formed:- Limewater
Type of reaction:- Endothermic
 - Product formed:- Slaked lime
Type of reaction:- Exothermic
 - Product formed:- Limestone
Type of reaction:- Exothermic
28. Which of the given metals exhibits both reactions (a) as well as (b)?
- (a) $\text{Metal} + \text{Oxygen} \rightarrow \text{Metal oxide}$
- (b) $\text{Metal} + \text{Cold water or hot water or steam} \rightarrow \text{Metal hydroxide} + \text{Hydrogen}$
- Magnesium (Mg), iron (Fe), sodium (Na), and copper (Cu)
 - Magnesium (Mg), zinc (Zn), platinum (Pt), and gold (Au)
 - Sodium (Na), potassium (K), magnesium (Mg) and calcium (Ca)
 - Copper (Cu), magnesium (Mg), gold (Au), and sodium (Na)

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29. A beam of white light passes through two inverted prisms as shown.



The emergent beam of light from the second prism will be:

[0.8 mark]

- A. White in colour
 - B. Red in colour
 - C. Yellow in colour
 - D. A patch of seven different colours
30. Which phenomena do we observe on Earth that is not caused due the Earth's atmosphere?
- A. Red sun
 - B. Blue sky
 - C. Early sunrise
 - D. Day & night

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31. Why is it necessary for the food to be broken down and digested?

- A. Large molecules in intact food pass through the digestive epithelium and enter the cell through the membrane, damaging the nuclear membrane. Hence, it must be broken down.
- B. Fats present in intact food contain very large molecules that cannot pass through cell membranes. Fats need to be passed through the digestive epithelium to be utilised.
- C. Large molecules present in intact food cannot pass through cell membranes. Nutrients need to be separated from food to be passed through the digestive epithelium to be utilised.
- D. If not broken down, large molecules produce toxic substances that pass through the epithelium of the digestive tract and are utilised by the cells. This can be lethal to the cells.

32. There is an increase in blood urea when there is insufficient filtration in _____.

- A. loop of Henle
- B. distal tubule
- C. Bowman's capsule
- D. collecting tubule

33. **Assertion:** Intensive exercise leads to muscle cramps.

Reason: Ethanol is produced as a result of anaerobic respiration.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not a correct explanation of A
- C. A is true but R is false
- D. A and R are false

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34. Assertion(A) - Waste products are stored in different parts of plants.

Reason(R) - Plants do not have excretory system.

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true but R is not the correct explanation of A.
- C. A is true but R is false.
- D. A is false but R is true.

35. Which of the following is correct?

- A. Acids are always kept in metallic vessels.
- B. Some metals catch fire easily when they come in contact with air.
- C. All metals are solid at room temperature.
- D. Copper reacts with $\text{dil. H}_2\text{SO}_4$ and evolves H_2 gas.

36. Assertion (A): Aluminium oxide is an example of amphoteric oxide.

Reason (R): Aluminium oxide reacts with both acids and bases.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not the correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

37. Which of the following types of nutrition can be observed in amoeba?

- A. Autotrophic
- B. Parasitic
- C. Saprophytic
- D. Holozoic

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38. **Assertion:** Carnivores have shorter small intestine while herbivores have longer small intestine.

Reason: Meat is more difficult to digest than cellulose.

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true but R is not a correct explanation of A.
- C. A is true but R is false.
- D. A and R are false.

39. **Assertion:** Mammals and birds are warm blooded organisms which maintain a uniform internal body temperature.

Reason: Mammals and birds have a four-chambered heart.

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true but R is not a correct explanation of A.
- C. A is true but R is false.
- D. A and R are false.

40. **Assertion:** Aquatic animals have a faster breathing rate as compared to terrestrial animals.

Reason: Dissolved oxygen concentration is lesser than the atmospheric oxygen.

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true but R is not a correct explanation of A.
- C. A is true but R is false.
- D. A and R are false.

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41. Three test tubes, labelled A, B, and C, contain different solutions. The results of dipping red and blue litmus papers in these test tubes are shown in the table below.

Analyse the table below and select the incorrect option from the following.

	Test tube A	Test tube B	Test tube C
Red Litmus	No change	No change	No change
Blue Litmus	Red	No change	Red

- A. The sample in test tube A is acidic
 - B. The sample in test tube A is neutral
 - C. The sample in test tube C is acidic
 - D. The sample in test tube B is neutral
42. Which of the following options is incorrect for electrolysis of brine solution?
- A. Sodium hydroxide can be produced by this process.
 - B. Gas given out at cathode burns with a pop sound.
 - C. Gas given out at anode is used for making bleaching powder.
 - D. Gas given out at cathode is used for making bleaching powder.
43. Assertion (A): Silver chloride is always kept in a dark coloured bottle.
Reason (R): Photolytic decomposition of silver chloride occurs in the presence of light.
- A. Both A and R are true and R is the correct explanation of A
 - B. Both A and R are true and R is not the correct explanation of A
 - C. A is true but R is false
 - D. A is false but R is true

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44. Choose the correct option regarding the following statements:

Statement 1: Sodium hydroxide is water soluble.

Statement 2: Copper oxide is an alkali.

- A. Only statement 1 is correct.
- B. Only statement 2 is correct.
- C. Both statements are incorrect.
- D. Both statements are correct.

45. A 3 cm long object is placed at 12 cm from a concave lens, perpendicular to its principal axis. The lens forms a virtual image whose size is 1.5 cm. Find the power of the lens.

- A. $-\frac{25}{3}D$
- B. $-8D$
- C. $-\frac{7}{36}D$
- D. $-\frac{25}{9}D$

46. Assertion (A) : A ray passing through the centre of curvature of a concave mirror after reflection, is reflected back along the same path.

Reason (R) : The ray passing through the centre of curvature is incident normally to the mirror.

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true but R is not the correct explanation of A.
- C. A is true but R is false.
- D. A is false but R is true.

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47. In an experiment, students need to get an upright image of an object using a lens of focal length 25 cm. The experiment was set up by putting the lens and the object at a distance of 10 cm. Students of group A used a convex lens and group B used a concave lens for their experiment. The ratio of magnification obtained by group A and group B is:

- A. $\frac{3}{7}$
- B. $\frac{7}{3}$
- C. 3
- D. 1

48. Assertion (A): Stars twinkle, while planets shine steadily.
Reason (R): Stars have their own light where as planet do not.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not the correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

49. Ingredients used in kitchens always amazes us through their magic. One of them is baking powder which has a compound X as its major constituent. The compound X sometimes also helps in getting relief from acid indigestion or even in ant bite. In the laboratory, when we heat compound X, it gets converted into Y which is anhydrous but absorbs water to become a hydrated salt Z, one of the raw materials of soaps and detergents.

(ii) Identify the compound Y and Z from the following:

- A. Y: NaHCO_3 , Z: $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
- B. Y: Na_2CO_3 , Z: $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
- C. Y: NaOH , Z: NaCl
- D. Y: NaHCO_3 , Z: Na_2CO_3

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50. Ingredients used in kitchens always amazes us through their magic. One of them is baking powder which has a compound X as its major constituent. The compound X sometimes also helps in getting relief from acid indigestion or even in ant bite. In the laboratory, when we heat compound X, it gets converted into Y which is anhydrous but absorbs water to become a hydrated salt Z, one of the raw materials of soaps and detergents.

(iv) Compound X is a basic compound because it is a salt of a _____.

- A. strong acid and strong base
- B. weak acid and weak base
- C. strong acid and weak base
- D. weak acid and strong base

51. Ingredients used in kitchens always amazes us through their magic. One of them is baking powder which has a compound X as its major constituent. The compound X sometimes also helps in getting relief from acid indigestion or even in ant bite. In the laboratory, when we heat compound X, it gets converted into Y which is anhydrous but absorbs water to become a hydrated salt Z, one of the raw materials of soaps and detergents.

(iii) The aqueous solution of Y changes _____.

- A. red litmus to blue
- B. blue litmus to red
- C. red litmus to colourless
- D. blue litmus to colourless

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52. Ingredients used in kitchens always amazes us through their magic. One of them is baking powder which has a compound X as its major constituent. The compound X sometimes also helps in getting relief from acid indigestion or even in ant bite. In the laboratory, when we heat compound X, it gets converted into Y which is anhydrous but absorbs water to become a hydrated salt Z, one of the raw materials of soaps and detergents.

(i) Identify the compound X from the following:

- A. NaHCO_3
- B. Na_2CO_3
- C. NaOH
- D. NaCl

53. **Case:** Transpiration is the evaporative loss of water by plants. It occurs mainly through the stomata in the leaves. Besides the loss of water vapour in transpiration, exchange of oxygen and carbon dioxide in the leaf also occurs through pores called stomata. Normally stomata remain open during the day and close at night.

Based on the above case answer the following question:

Which of the following will not directly affect the rate of transpiration?

- A. Temperature
- B. Wind speed
- C. Light intensity
- D. Chlorophyll content of leaves

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54. **Case:** Transpiration is the evaporative loss of water by plants. It occurs mainly through the stomata in the leaves. Besides the loss of water vapour in transpiration, exchange of oxygen and carbon dioxide in the leaf also occurs through pores called stomata. Normally stomata remain open during the day and close at night.

Based on the above case answer the following question:

Water vapour comes out from the plant leaf through the stomatal opening. Through the same stomatal opening, carbon dioxide diffuses into the plant during photosynthesis. Reason out the above statements using one of the following options.

- A. The above processes happen only during night time.
 - B. One process occurs during the day time and the other during night.
 - C. Both processes cannot happen at the same time.
 - D. Both processes can happen together at daytime.
55. **Case:** Transpiration is the evaporative loss of water by plants. It occurs mainly through the stomata in the leaves. Besides the loss of water vapour in transpiration, exchange of oxygen and carbon dioxide in the leaf also occurs through pores called stomata. Normally stomata remain open during the day and close at night.

Based on the above case answer the following question:

Which of the following statements is not true for stomatal apparatus?

- A. Guard cells regulate the closing and opening of the stomatal pore.
- B. Guard cells enclose the stomatal pores.
- C. Stomata are involved in gaseous exchange.
- D. The guard cells shrink to open the stomatal pore.

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56. **Case:** Transpiration is the evaporative loss of water by plants. It occurs mainly through the stomata in the leaves. Besides the loss of water vapour in transpiration, exchange of oxygen and carbon dioxide in the leaf also occurs through pores called stomata. Normally stomata remain open during the day and close at night.

Based on the above case answer the following question:

Which of the following is not a purpose of transpiration?

- A. Helps in absorption and transport in plants.
 - B. Prevents loss of water.
 - C. Maintains shape and structure of plants by keeping the cells turgid.
 - D. Supplies water for photosynthesis.
57. **Case:** Pooja did an experiment with an equilateral glass prism in which she projected a narrow beam of white light source from one side of the surface of the prism and placed a screen on the other side of the prism. She observed certain patches of different colours on the screen. Later, she repeated the same experiment with a red-light source, however, she could only observe a red coloured patch on the screen. Again, she repeated the experiment with blue and green light sources, respectively, and could only see one colour patch on both the occasions.

The reason why she could not see any other colour when the red light was used as source because:

- A. The prism was defective
- B. Red light source is monochromatic
- C. Red colour does not refract in prism
- D. The prism is opaque to red colour

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58. **Case:** Pooja did an experiment with an equilateral glass prism in which she projected a narrow beam of white light source from one side of the surface of the prism and placed a screen on the other side of the prism. She observed certain patches of different colours on the screen. Later, she repeated the same experiment with a red-light source, however, she could only observe a red coloured patch on the screen. Again, she repeated the experiment with blue and green light sources, respectively, and could only see one colour patch on both the occasions.

What can be the correct explanation of the phenomenon observed by Pooja?

- A. Different wavelengths travel at different speeds in glass
 - B. Different lights travel faster in glass at different rates
 - C. Any light would disperse in the prism
 - D. Enough data is not available to make a scientific explanation in this case
59. **Case:** Pooja did an experiment with an equilateral glass prism in which she projected a narrow beam of white light source from one side of the surface of the prism and placed a screen on the other side of the prism. She observed certain patches of different colours on the screen. Later, she repeated the same experiment with a red-light source, however, she could only observe a red coloured patch on the screen. Again, she repeated the experiment with blue and green light sources, respectively, and could only see one colour patch on both the occasions.

Which of the following natural phenomena could she also relate to which is similar to the one she observed in the experiment?

- A. Blue colour of the sky
- B. Early sunrise or delayed sunset
- C. Formation of rainbow
- D. Reddish colour of the sky during sunset

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60. **Case:** Pooja did an experiment with an equilateral glass prism in which she projected a narrow beam of white light source from one side of the surface of the prism and placed a screen on the other side of the prism. She observed certain patches of different colours on the screen. Later, she repeated the same experiment with a red-light source, however, she could only observe a red coloured patch on the screen. Again, she repeated the experiment with blue and green light sources, respectively, and could only see one colour patch on both the occasions.

The phenomenon that she was trying to demonstrate was:

- A. Scattering
- B. Refraction
- C. Dispersion
- D. Reflection