BUDHA DAL PUBLIC SCHOOL PATIALA

First Term Examination (12 September 2022)

CLASS X

PAPER- SCIENCE (SET-A) M.M. 80

Time:3 hr.

General Instructions:

(i) The question paper comprises four sections A, B, C, D and E. There are 36 questions in the question paper. All questions are compulsory.

(ii) Section–A - question no. 1 to 16 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions.

(iii) Section–B – Case Study Based question no. 17 & 18.

(iv) Section–C - question no. 19 to 24 are short answer type questions, carrying 2 marks each.

(iv) Section–D - question no. 25 to 34 are short answer type questions, carrying 3 marks each.

(v) Section–E – question no. - 34 to 36 are long answer type questions carrying 5 marks each.

(vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

(vii) Wherever necessary, neat and properly labeled diagrams should be drawn.

Section - A

Q1. Three students A, B and C focused a distant building on a screen with the help of a concave mirror. To determine focal length of the concave mirror they measured the distances as given below: (1)

Student A : From mirror to the screen

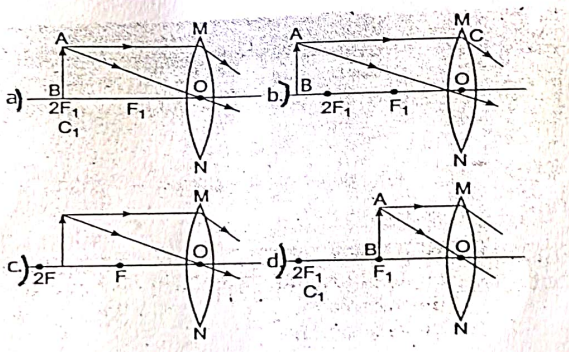
Student B : From building to the screen

Student C : From building to the mirror

Who measured the focal length correctly?

a) Only A b) Only B c) A and B c) B and C

Q2. A student wants to obtain magnified image of an object AB as on a screen. Which one of the following arrangements shows the correct position of AB for him/her successful? (1)



Q3. Define function of eye lens. (1)

Q4. Identify the substance that is getting oxidized and substance that is getting reduced in the following reactions : (1)

$$CuO + H_2 \rightarrow Cu + H_2O$$

A-1

Q5. Fill in the blank:
Brine is a saturated solution of _____. (1)

Q6. State and explain whether the aqueous solution of $CuSO_4$ is acidic or alkaline. (1)

Q7. The correct sequence of anaerobic respiration in yeast is (1)

a) $Glucose \xrightarrow{Cytoplasm} Pyruvate \xrightarrow{Mitochondria} Ethanol + Carbondioxide$

b) $Glucose \xrightarrow{Cytoplasm} Pyruvate \xrightarrow{Cytoplasm} Lactic\ acid$

c) $Glucose \xrightarrow{Cytoplasm} Pyruvate \xrightarrow{Mitochondria} Lactic\ acid$

d) $Glucose \xrightarrow{Cytoplasm} Pyruvate \xrightarrow{Cytoplasm} Ethanol + Carbondioxide$

Q8. How do Rhizopus (Bread mould) obtain nutrition? (1)

a) By using nutrients from the bread to prepare their own food.
b) By allowing other organisms to grow on the bread and then consuming them.
c) By breaking down the nutrients of bread and then absorbing them.
d) By eating the bread on which it is growing.

Q9. Dramatic changes of body features in males associated with puberty are mainly because of the secretion of : (1)

a) Oestrogen from testes and testosterone from ovary.
b) Testosterone from ovary
c) Testosterone from testes
d) Oestrogen from adrenal glands.

Q10. Name the digestive gland that secretes bile.

OR (1)

Which gland secretes several enzymes needed to break down food?

Q11. If 10,000 J solar energy fall on green plants in a terrestrial ecosystem, what percentage of solar energy will be converted into food energy? (1)

a) 10,000 J
b) 100 J
c) 1000 J
d) It will depend on the type of terrestrial plant.

OR

Which of the following limits the number of trophic levels in a food chain?

a) Decrease in energy in higher trophic
b) Less availability of food.
c) Polluted Air
d) Water

Each of the following questions (Q.No. 12 to Q.No 16) consists of two statements, one is Assertion (A) and the other is Reason (R). Give answer:

a) **Both Assertion (A) and Reason (R) true and Reason (R) is the correct explanation of Assertion (A).**
b) **Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).**
c) **Assertion (A) is true but Reason (R) is false.**
d) **Assertion (A) is false but Reason (R) is true.**

Q12. **Assertion (A) :** A ray incident along normal to the mirror retraces its path. (1)
Reason (R) : In reflection, angle of incidence is always equal to angle of reflection.

Q13. **Assertion (A) :** A convex lens can form a magnified erect as well as magnified inverted image of an object placed in front of it. (1)
Reason (R) : A magnified and inverted image can be obtained by a convex lens when an object is kept between F and C.

Q14. **Assertion (A) :** In electrolysis of water the volume of Hydrogen is twice the volume of oxygen formed. (1)
Reason (R) : Hydrogen and oxygen are in ratio of 1 :2.

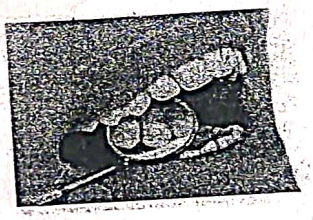
Q15. **Assertion (A) :** During indigestion, the body produces less acid causing acidity. (1)
Reason (R) : Acidity may be treated by using milk of Magnesia.

Q16. **Assertion (A) :** Insulin regulates blood sugar level. (1)
Reason (R) : Insufficient secretion of insulin cause diabetes.

Section – B

Case Study Based: Answer the questions following the paragraph on the basis of the understanding the given paragraphs and the related concepts.

Q17. Tanmay went to a dentist for regular cleaning where he observes that the dentist uses a small, hand-held mirror to examine his teeth and gums from a variety of angles. He finds out that the mirror gives a magnified reflection of the mouth which is easier for the dentist to see. (5)



He decided to make a dentist mirror. He bought three mirrors, M_1, M_2 and M_3 out of which M_1 was curved inwards, M_2 was curved outwards and M3 shows lateral inversion.

Read the above passage carefully and give the answer of the following questions:

Q1. Based on the above diagram, what kind of mirrors would Tanmay need to make the dentist mirror?

a) plane mirrors b) concave mirrors c) convex mirrors d) acoustic mirrors

Q2. The laws of reflection hold good for:

a) M_1 only b) M_3 only c) M_2 only d) M_1, M_2 and M_3

Q3. A full length image of a distant tall building can definitely be seen by Tanmay using:

a) mirror M_1 b) mirror M_2 c) mirror M_3 d) both M_1 and M_3

Q4. Magnification produced by mirror M_3 is always:

a) less than one b) more than 1 c) equal to 1 d) more or less than 1

Q5. Under which of the following conditions can M1 form an image Larger than the actual object?

a) When object is placed between focus and centre of curvature.
b) When object is placed at a distance equal to its radius of curvature.
c) When object is placed at a distance less than its focal length.
d) When object is placed at a distance greater than its radius of curvature.

OR

We know that when light goes from one medium to another medium having different optical densities, then refraction of light rays (or bending of light rays) takes place. Now, in the atmosphere, we have air everywhere. But all the air in the atmosphere is not at the same temperature. Some of the air layers of the atmosphere are cold whereas other air layers of the atmosphere are comparatively warm (or hotter). Now the cooler air layers of the atmosphere behave as optically denser medium for light rays whereas the warmer air layers (or hotter air layers) of the atmosphere behave as optically rarer medium for the light rays. So, in the same atmosphere we have air layers having different optical densities. And when light rays pass through the atmosphere having air layers of different optical densities, then refraction of light takes place. The refraction of light caused by the earth's atmosphere (having air layers of varying optical densities) is called atmospheric refraction.

Read the above passage carefully and give the answers of the following questions:

Q1. With respect to atmospheric refraction which of the following point distinguish between cold air and hot air?

a) Cold air is denser than hot air
b) Hot air is lighter than cold air
c) Cold air has higher refractive
d) All of the above

Q2. What is the reason behind twinkling of stars?

a) Dispersion of star light
b) Reflection of star light
c) Refraction of star light
d) All of these

Q3. Why sun appears reddish incolour during sunrise and sunset?

a) Because sun is closer to Earth
b) Because Earth is rotating
c) Because scattering of light
d) Because of atmospheric refraction

Q4. How much time from sunrise to sunset is lengthened because of atmospheric refraction?

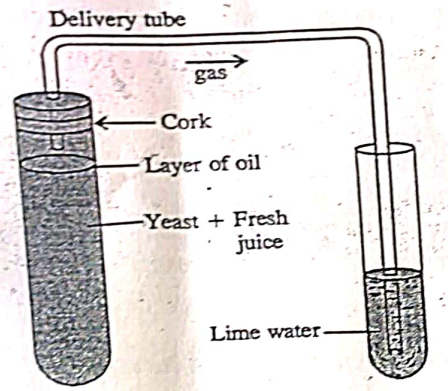
a) 4 hours b) 2 minutes c) 4 minutes d) 2 hours

Q5. When light rays from stars enter into Earth's atmosphere, it travels from:

a) denser to rarer medium b) rarer to denser medium
c) rarer medium to vacuum d) denser medium to vacuum

Q18. (5)

Alcoholic Fermentation : Anurag mixed fresh juice with yeast and poured it in a large test tube. He put a drop of non-drying oil over it to exclude oxygen. He fitted a cork having a delivery tube over the mouth of test tube, He dipped the free end of delivery tube into smaller test tube having lime water.



1. **It was observed that**
   (a) Mixture appears frothy
   (b) Lime water turns milky after some time
   (c) Content of large test tube smells of alcohol
   (d) All of these.

2. **Yeast brings about alcoholic fermentation accompanied by evolution of**
   (a) carbon dioxide (b) oxygen
   (c) hydrogen (d) none of these.

3. **Fermentation is an**
   (a) aerobic breakdown of carbohydrates (b) anaerobic breakdown of carbohydrates.
   (c) may be (a) or (b) (d) none of these.

4. **The carbohydrates are brokedown by**
   (a) micro-organism (b) macro-organism
   (c) both (a) and (b) (d) none of these.

5. **Fermentation is used in**
   (a) brewing industry (b) baking industry
   (c) cleaning of hides (d) all of these.

A-5

Section – C

Q19. A 10cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 12cm. The distance of the object from the lens is 18cm. Find the nature, position and size of the image formed. (2)

Q20. With the help of labelled ray diagram, show the path followed by a narrow beam of monochromatic light when it passes through a glass prism. (2)

Q21. Why is silver Bromide stored in dark coloured bottles in the laboratories? Write the chemical equation to justify your answer. (2)

Q22. Name the compound of calcium used for disinfecting drinking water. Give its chemical name and equation of preparation. (2)

Q23. Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms? What is the importance of rings of cartilage in human respiratory system? (2)

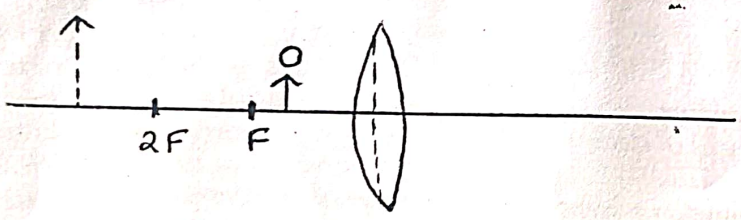
Q24. Draw a flow chart of reflex arc when hot pan acts as a stimulus. (2)

Section – D

Q25. What happens after refraction, when:
a) a ray of light parallel to the principal axis passes through a concave lens? (3)
b) a ray of light falls on a convex lens while passing through its principal focus?
c) a ray of light passes through the optical centre of a convex lens?

OR

The diagram given below shows an object O and its image I.



Without actually drawing the ray diagram, state the following:
a) Type of lens (Converging/ Diverging)
b) Name two optical instruments where such an image is obtained
c) List three characteristics of the image formed if this lens is replaced by a concave mirror of focal length 'f' and an object is placed at a distance 'f/2' in front of the mirror.

Q26. A student suffering from myopia is not able to see distinctly the objects placed beyond 5m. List two possible reasons due to which this defect of vision may have arisen. With the help of ray diagrams, explain: (3)

a) Why the student is unable to see distinctly the objects placed beyond 5m from his eyes.
b) The type of the corrective lens used to restore proper vision and how this defect is corrected by the use of this lens.

Q27. Name the type of mirror which facilitates (3)

a) Shaving
b) Observing the rear view in vehicles.

Give reason to justify your answer in each case.

Q28. Following acidic solutions have given pH values:

a) Coffee (pH = 4.8)
b) Tomato (pH = 4.4)
c) Lemon Juice (pH = 2.3)
i) Which of these is most acidic?
ii) Which of these has minimum (H^+) concentration?
iii) Arrange them in order of increasing (H^+) concentration.

Q29. Write the balanced chemical equation for the following chemical reactions: (3)

a) $Sodium + Water \rightarrow Sodium\ hydroxide\ and\ Hydrogen$
b) $Potassium\ Bromide_{(aqu)} + Bariumiodide_{(aqu)} \rightarrow Potassiumiodide_{(aqu)} + Barium\ Bromide_{(aqu)}$

OR

Complete the equation and identify the type of chemical reaction:

a) $Zn + CuSO_4 \rightarrow$
b) $CaCo_3 \xrightarrow{Heat}$

Q30. (3)

a) Bee sting cause pain and irritation. Rubbing of baking soda on the sting area gives relief. How?
b) Plaster of Paris should be stored in moister proof container?
c) Decomposition reactions are opposite of combination reaction.

Q31. (3)

a) What are peristaltic movements?
b) What is the signification of villi present in the small intestine.
c) Why is small intestine in herbivores longer than in carnivores?

Q32. (3)

a) How is transpiration useful for plants?
b) Why do plants need less energy?
c) Which components of phloem help in translocation of food?

OR

a) Define Geotropism? Give one example
b) Name the hormones secreted by the following glands
i) Pancreas ii) Pituitary gland iii) Adrenal gland

Q33. a) How is ozone formed? Write its equation or reaction involved?
b) Draw a terrestrial food chain and state different trophic levels in it. (3)
c) Name the compounds responsible for ozone depletion.

Section - E

Q34. Analyse the following observation table showing variation of image-distance (v) with object-distance (u) in case of convex lens and answer the questions that follow without doing any calculations: (5)

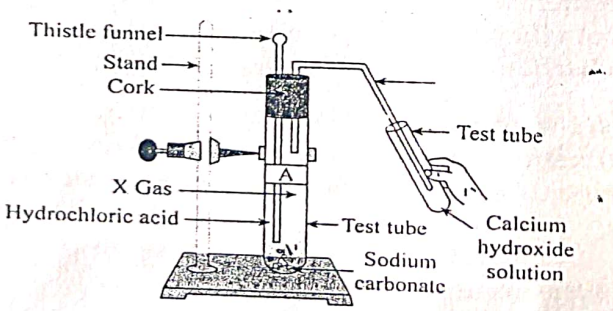
S.No.	Object-Distance u (cm)	Image-Distance v (cm)
1	- 100	+ 25
2	- 60	+ 30
3	- 40	+ 40
4	- 30	+ 60
5	- 25	+ 100
6	- 15	+ 120

a) What is the focal length of the convex lens? Give reason to justify your answer.
b) Write the serial number of the observation which is not correct. On what basis have you arrived at this conclusion?
c) Select an appropriate scale and draw a ray diagram for the observation at S. No.2.

OR

a) One-half of a convex lens of focal length 10cm is covered with a black paper. Can such as lens produce an image of a complete object placed at a distance of 30cm from the lens? Draw a ray diagram to justify your answer.
b) A 4cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20cm. The distance of the object from the lens is 15cm. Find the nature, position and size of the image.

Q35. **Look at the figure and answer the following questions:** (5)



a) Identify the gas X evolved in the above reaction.
b) What change do you observe when X is passed through the solution in the test tube B?
c) If you continue passing X through B, will be any change in the product formed? If yes, explain.
d) Write the balanced chemical equations of the reactions involved in the test tube B.

OR

a) The Blue colour of a crystal of a substance changed on heating in a closed test tube but the colour was regained after some time on cooling. Name the substance and write its formula.
b) Name any two olfactory indicators.
c) Do basic solutions also have H^+ion? If yes then why are these Basic.

Q36. a) Draw diagram of Human heart. Name and label the following parts :
i) Receives oxygenated blood from pulmonary arteries. (5)
ii) Main artery that carries oxygenated blood to all parts except lungs.
iii) Partition wall that separates oxygenated and deoxygenated blood.
b) In which side of the heart deoxygenated blood flows?

OR

a) Draw the diagram of 'STRUCTURE OF NEPHRON' Name and label the following parts:
i) U-shaped tube
ii) Double-walled cup
iii) Structure formed of branches of capillaries of renal artery.

b) What is Hemodialysis? Which patients undergo dialysis?