MID-TERM EXAMINATION

Question Paper 2024-25

NCERT BASED SYLLABUS

FOR CBSE AND STATE BOARD
FOLLOWING NCERT

Mid Term Exam Question Paper 2024-25

SET – B

Name : .....

Roll No. : .....

Date : 19.09.2024

Class : X

MIDTERM EXAMINATION 2024

SUBJECT : SCIENCE

Time : 3 Hrs.

M.M. : 80

General Instructions:

(a) The question paper consists of 39 questions in **3 Sections** : **Section A – Physics, Section – B Chemistry & Section – C Biology.**

(b) All questions are compulsory. However internal choice is provided in some questions. A student is expected to attempt only one out of these questions.

(c) 20 objective type questions carrying 1 mark each. Students have to write correct option and answer both.

(d) 6 very short answer questions carrying 02 marks each. Answer to these questions should be in the range of 30 to 50 words.

(e) 7 short answer questions carrying 03 marks each. Answer to these questions should be in the range of 70 to 80 words.

(f) 3 long answer questions carrying 05 marks each. Answer to these questions should be in the range of to 80 to120 words.

(g) 3 source – based/ case – based unit of assessment of 04 marks each with sub parts.

(h) **For assertion and reasoning questions options are :**

(a) Assertion (A) and Reason (R) both are true, and Reason is the correct explanation of Assertion.

(b) Assertion (A) and Reason (R) both are true, but Reason is not the correct explanation of Assertion.

(c) Assertion is true but Reason is false.

(d) Assertion is false but Reason is true.

SECTION – A : PHYSICS (27 Marks)

01. Variable focal length of eye lens is responsible for

(A) accommodation of eye (B) persistence of vision

(C) colour blindness (D) least distance of distinct vision. **(1)**

02. In order to obtain a magnification of, -0.6 (minus 0.6) with a concave mirror, the object must be place

(A) At the focus (B) Between pole and focus

(C) Between focus and center of curvature (D) Beyond the center of curvature **(1)**

03. **Assertion (A) :** A person suffering from myopia cannot see the distant objects clearly.

Reason (R) : A converging lens is used for the correction of myopic eye as it can form real as well as virtual images of the objects placed in front of it. **(1)**

04. Which of the following is not caused by the atmospheric refraction of light?

(A) twinkling of stars at night

(B) sun appearing higher in the sky than it actually is

(C) sun becoming visible two minutes before actual sunrise

(D) sun appearing red at sunset **(1)**

05. A concave lens form the image of an object which is:

(A) Virtual inverted and diminished (B) Virtual upright and diminished

(C) Virtual inverted and enlarged (D) Virtual upright and enlarged **(1)**

06. Manju has two convex lens A and B made of same material A is thinner while B is thicker. She is looking at printed text using lens A, she noticed that when she slowly takes the lens away from the page, the text turns upside down when the lens crosses a distance of 10cm from the page.

(a) What characteristic of lens A does the distance 10cm signify?

(b) If Manju does the same with lens B, at what distance will the inversion of the image happen – less that, equals to or more than 10cm? justify your answer. **(2)**

07. State the role of ciliary muscles in human eye. What is accommodation? **(2)**

OR

Name the part of the human eye –

(a) Which controls the amount of light entering the eye?

(b) Determine the colour of the eye?

(c) Transmit visual information from eye to brain?

(d) Light sensitive screen contains cells used to detect dim light? **(2)**

08. (a) What do you understand by scattering of light?

(b) How does the size of scattering particles and wavelength of light affect the scattering? **(1+2)**

Contd...2

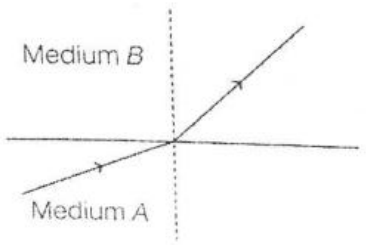
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09. A student has three concave mirrors A, B & C of focal length 30cm, 20 cm and 10cm, respectively. For each concave mirror, he performs the experiment of image formation for three values of object distance of 30cm, 10cm and 20cm.
(a) For the three object distances, identify the mirror which will form an image equal in size to that object. Also write the object distance.
(b) For mirror B, draw a ray diagram for image formation for object distance 20cm and 10cm. **(1+2)**

10. Define: (a) Absolute Refractive index
(b) Principal focus of a concave lens
(c) Power of a lens **(3)**

11. (a) Draw a ray diagram showing refraction of light through a rectangular glass slab.
Mark the following in the diagram (a) lateral displacement (b) angle of incidence (c) angle of refraction (d) angle of emergence.
(b) A light ray enters from medium A to medium B as shown in figure.



(i) Which of the two medium is denser with respect to other medium? justify your answer.
(ii) Speed of light in medium A is V_a and in medium B is V_b, what is the refractive index of medium B with respect to medium A? **(3+2)**

OR

(a) Show by completing the ray diagram.
(i) A ray of light falls parallel to principal axis on a convex lens.
(ii) A ray of light passing through principal focus of a concave lens.
(b) A student wants to project the image of a candle flame on the wall of a school laboratory by using a mirror.
(i) Which mirror he will use and why?
(ii) At what distance in term of focal length f of the mirror, should he place the candle flame to get the magnified image on the wall?
(iii) Draw a ray diagram to show formation of image in this case. **(2+3)**

12. Rainbows are formed when sunlight is scattered from raindrops into the eyes of an observer.
Most raindrops are spherical rather than the often depicted 'teardrop' shape and it is this spherical shape that provides the conditions for a rainbow to be seen.
The position of the sun and the raindrops in relation to the observer need to be just right for a rainbow to form:

- The sun needs to be behind the viewer
- The sun needs to be low in the sky, at an angle of less than 42° above the horizon. The lower the sun in the sky the more of an arc of a rainbow the viewer will see
- Rain, fog or some other source of water droplets must be in front of the viewer

The size of the raindrops does not directly affect the geometry of a rainbow, but mist or fog tends to disperse the effect more.
Rainbows only appear semi-circular over level ground at sunrise or sunset, when the sun is exactly on the horizon, the majority of the time a smaller segment of an arc is seen.
Based on the above information answer the following questions.
(a) In the morning time we can see rainbow in which direction? Specify North, South, East or West. **(1)**
(b) What is cause of the dispersion of light? **(1)**
(c) Draw the ray diagram for formation of rainbow in sky and name the sequence of phenomenon that takes place. **(2)**

OR

In dispersion of light by glass prism which colour light deviates the least and which colour light deviates the most? **(2)**

Contd...3

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Section – B : Chemistry (26 Marks)

13. Which of the following metals fails to evolve hydrogen gas with dilute HCl?
(A) Zinc (B) Iron (C) Gold (D) Aluminium **(1)**

14. Which acid is present in the stings of bees and ants?
(A) acetic acid (B) nitric acid (C) oxalic acid (D) formic acid **(1)**

15. An element common to all acids is:
(A) Hydrogen (B) Chlorine (C) Nitrogen (D) Carbon. **(1)**

16. On heating Iron (II) sulphate crystals, one would get:
(A) sweet smell (B) rotten egg smell
(C) irritating smell of burning sulphur (D) no smell **(1)**

17. A few drops of aqueous NaOH are dropped on a pH paper. The colour of the pH paper will turn to:
(A) violet (B) green (C) black (D)yellow **(1)**

18. The difference of the molecules of water in gypsum and plaster of Paris is:
(A) 5/2 (B) 2 (C) ½ (D) 3/2 **(1)**

19. Hydrogen gas:
(A) is colorless (B) is odourless (C) burns with a blue flame (D) all options are correct **(1)**

20. **Assertion (A) :** Decay of teeth is due to the decrease in pH in the mouth.
Reason (R) : Acids which released slowly in the mouth, destroy the enamel coating which protects teeth. **(1)**

21. **Assertion (A) :** Copper can displace silver from aqueous silver nitrate solution.
Reason (R) : Silver is placed above copper in the reactivity series of metals. **(1)**

22. Explain the following in terms of gain or loss of oxygen with one example each
(a) oxidation (b) reduction. **(2)**

23. Which types of reactions are represented by the following equations?
(a) $CaO + CO_2 \rightarrow CaCO_3$
(b) $Mg + CuSO_4 \rightarrow MgSO_4 + Cu$
(c) $2NH_3 \rightarrow N_2 + 3H_2$ **(3)**

OR

When you mix solutions of Lead (II) nitrate and Potassium iodide,
(a) What is the colour of the precipitate formed? Name the compound involved.
(b)Write a balanced chemical equation for the reaction.
(c) Is this a double displacement reaction?

24. Five solutions A, B, C, D and E when tested with universal indicator show pH as 4, 2, 12, 7 and 9 respectively. Which solution is:
(a) neutral (b) strongly alkaline (c) strongly acidic (d) weakly alkaline
(e) weakly acidic?
(f) arrange the pH in increasing order of hydrogen ion concentration. **(3)**

25. (a) What is neutralisation reaction? Give two examples.
(b) Write one use each of baking soda and washing soda. **(5)**

OR

(a) Why is respiration considered an exothermic reaction? Write equation to support your answer.
(b) Why do we apply paint on iron articles?
(c) Oil and fat containing food items are filled with nitrogen gas. Why?

26. Sodium hydroxide or caustic soda is an useful industrial chemical and is manufactured by chlor-alkali process. In the process, a gas X is formed as the by-product. It reacts with slaked lime to give a compound Y which finds application as a bleaching agent for the clothes.
(a) Name the gas X and the compound Y formed.
(b) Which is the main raw material for the process?
(c) Write the chemical equation involved in this process. Also write one use of the alkali produced in the reaction.

OR

(c) How is compound Y formed from gas X ? Write the chemical equation involved. **(1+1+2)**

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Section – C : Biology (27 Marks)

27. Which nerves transmit impulses from the central nervous system towards muscle cells?
(A) Sensory nerves (B) Motor nerves (C) Relay nerves (D) Cranial nerves **(1)**

28. Identify which of the following statements about thyroxin is incorrect?
(a) Thyroid gland requires iodine to synthesize thyroxin.
(b) Thyroxin is also called thyroid hormone.
(c) It regulates protein, carbohydrates and fat metabolism in the body.
(d) Iron is essential for the synthesis of thyroxin. **(1)**

29. Which of the following is the correct sequence of body parts in the human alimentary canal?
(a) Mouth → stomach → small intestine → large intestine → oesophagus
(b) Mouth → oesophagus → stomach → small intestine → large intestine
(c) Mouth → stomach → oesophagus → small intestine → large intestine
(d) Mouth → oesophagus → stomach → large intestine → small intestine. **(1)**

30. Movement of sunflower in accordance with the path of Sun is due to
(A) Chemotropism (B) Geotropism (C) Phototropism (D) Hydrotropism **(1)**

31. **Assertion (A) :** Animals can react to stimuli in different ways.
Reason (R) : All animals have a nervous system and an endocrine system involving hormones. **(1)**

32. In which of the following groups of organisms are food materials broken down outside the body and absorbed?
(A) Mushroom, green plants, amoeba (B) Yeast, mushroom, bread mould
(C) Paramecium, amoeba, cuscuta (D) Cuscuta, lice, tapeworm **(1)**

33. If a plant is releasing carbon dioxide and taking in oxygen during the day does it mean that there is no photosynthesis occurring? Justify your answer. **(2)**

34. Why do arteries have thick and elastic walls whereas veins have valves? **(2)**

35. Name two types of neuron according to their function. How is the functioning of one is different from the other?
OR **(2)**
(a) What is the role of cytokinin in plants?
(b) Where are auxins synthesized during positive phototropism and negative geotropism?

36. (a) Where do you find the respiratory pigments in human bodies?
(b) Which point is common between aerobic and anaerobic respiration?
(c) Why is the removal of faeces from the alimentary canal not considered to be excretion? **(3)**

37. (a) What is a reflex arc?
(b) Draw a neat labelled schematic flowchart of reflex arc showing the components in an order (take any stimulus like pin prick/hot plate touching). **(3)**

38. (a) Name the basic filtration unit present in the kidney. How many of them are present in each kidney?
(b) Draw the structure of such an unit & label – glomerulus, bowman's capsule, renal arteries, collecting duct
(c) How do we control the urge to urinate?
OR **(5)**
(a) How are the lungs designed in human beings to maximize the area for exchange of gases?
(b) Schematically represent transport & exchange of oxygen & carbon dioxide in the blood circulatory system. (Label lungs, heart, blood vessels with proper direction of blood flow.)

39. **CASE STUDY BASED QUESTION –** Smita's father was complaining about frequent urination, pain in legs and a frequent weight loss to Smita's mother and she discussed the things with her daughter when Smita's mother returned from her school. Listening this, Smita said to her mother that her father should visit a doctor, who told her mother that her husband is having an elevated level of blood glucose. He should take care of his diet and should exercise regularly to maintain his normal glucose level.
On the basis of given text, answer the following questions.
(i) Name the disease he is suffering from and name the hormone, whose deficiency causes it. **(1)**
(ii) Identify the gland that secretes it and mention the endocrine function of it. **(1)**
(iii) Explain, how the time and amount of secretion of this hormone is regulated in human system.
OR **(2)**
(iii) What is the name of the mechanism that controls the secretion or stoppage of secretion of hormones. Does the gland in question has exocrine function? If yes what is that?

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