CBSE · CLASS 10 · SCIENCE

CBSE Class 10 Science Guess Paper 2027

Time: 3 hours · Maximum marks: 80 · 39 questions

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Section A

Biology + Environment (World of Living 25 + Natural Resources 5 = 30 marks). 16 questions: 7 MCQ, 2 Assertion-Reason, 3 VSA(2m), 2 SA(3m), 1 case study(4m), 1 LA(5m). Internal choice in 1 VSA, the case study, and the LA.

Q1. Which of the following options indicates the products formed after breakdown of the glucose in our muscle cells when there is lack of oxygen? A. Ethanol + carbon dioxide + Energy B. Lactic acid + Energy C. Lactic acid + carbon monoxide + Energy D. Carbon dioxide + Water + Energy — 1 mark

Q2. Following are the statements about the different parts of the brain. Select the correct statements. (i) The thinking part of the brain is the forebrain. (ii) Centres for smell, hearing, memory, sight are located in forebrain. (iii) Salivation, vomiting, blood pressure are controlled by medulla in the hind brain. (iv) Cerebellum does not control the posture and balance of the body. (A) (i), (ii) and (iii) (B) (ii), (iii) and (iv) (C) (i), (ii) and (iv) (D) (i), (iii) and (iv) — 1 mark

Q3. Two pea plants, one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds were crossed with each other which produced F_1 progeny that have only round yellow (RrYy) seeds. When F_1 plants are self-pollinated, the F_2 progeny will have which new combination of characters, as compared to the parents: (i) Round, yellow (ii) Round, green (iii) Wrinkled, yellow (iv) Wrinkled, green. Correct options are: (A) (i) and (ii) (B) (i) and (iv) (C) (ii) and (iv) (D) (i) and (iii) — 1 mark

Q4. The plant hormone whose concentration stimulates the cells to grow longer on the side of the shoot which is away from light is : (A) Cytokinins (B) Gibberellins (C) Adrenaline (D) Auxins — 1 mark

Q5. The percentage of solar energy which is not converted into food energy by the leaves of green plants in a terrestrial ecosystem is about : (A) 1% (B) 10% (C) 90% (D) 99% — 1 mark

Q6. Given below are some of the statements regarding our environment: (i) Change in our life-styles have resulted in greater amounts of waste material generation. (ii) Changes in attitude have resulted in use of more disposable things. (iii) Changes in packaging has resulted in much of our waste becoming non-biodegradable. (iv) Organic farming. Which amongst these is not leading to any damage of environment? (A) (i), (ii), (iii) (B) (iv) (C) (i) and (iii) (D) (ii) and (iv) — 1 mark

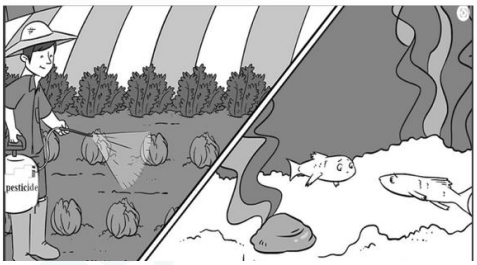
Q7. In human beings the oxygen rich blood is pumped out to the body by: (A) contraction of right atrium (B) relaxation of left ventricle (C) contraction of right ventricle (D) contraction of left ventricle — 1 mark

Q8. Assertion (A): Tallness of a pea plant is controlled by an enzyme. Reason (R): The gene for that enzyme makes proteins which help the plant to be tall. Options: 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. — 1 mark

Q9. Assertion (A): The number of chromosomes in a cell and in a germ cell is not the same in any species. Reason (R): When 2 germ cells combine they restore the normal number of chromosomes in a species. [Options: 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] — 1 mark

Q10. Draw labelled diagrams to show different stages of budding in Hydra. — 2 marks

Q11. The given cartoon addresses a growing concern (a farmer spraying pesticide on a cabbage farm, with the pesticide accumulating along a food chain up to fish). What impact will the process shown in the image have on Humans if they occupy the last trophic level? Explain. — 2 marks

	B. You are given 2 fuse wires A and B with current ratings 2A and 5A respectively. Justify with reason which of the two would you use with a 1000W, 220V room heater?	
26	The cartoon below addresses a growing concern: 	2

Q12. Explain the mechanism by which the water is transported in plants. — 2 marks

Q13. Study the given table and answer the following questions: [Parents: A pea plant with red flowers was crossed with a pea plant with white flowers. | F_1: 30 seeds were sown and all bore plants with red flowers. | F_2: 44 seeds were sown, 33 plants bore red flowers and 11 plants bore white flowers.] (a) Depict the information given in the table in the form of a cross. (b) Deduce the F_2 phenotypic ratio / F_2 ratio showing external look as well as genotypic/genetic makeup, ratio. — 3 marks

Q14. Plants have neither a nervous system nor muscles, even then they respond to stimuli. For example, the leaves of chhui-mui (touch-me-not) plant when touched begin to fold up and droop. (a) How is the information communicated in "touch-me-not" plants ? (b) What enables the plant cells to bring out the observable response ? (c) Differentiate the movement mentioned above from the movement of tendrils in a pea plant. — 3 marks

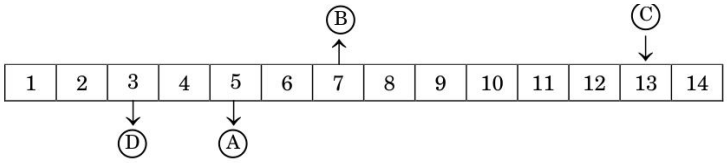
Q15. [case context] Neha consumed boiled sweet potatoes and boiled eggs for breakfast; questions explore steps in the digestion of this food. Attempt either subpart A or B. A. Which of these food items is rich in proteins? In which part of the alimentary canal is the digestion of this component initiated? Name the enzymes, conditions required and the glands associated with the digestion here. — 4 marks

Q16. Puneet wanted to grow banana plants. (i) Based on your knowledge on plant reproduction should he opt for seeds or any alternate method of reproduction? Justify your answer. (ii) Offsprings of a banana plant usually show very little variation. What causes variation and are variations good or bad? Justify. 5 marks

Section B

Chemistry (Chemical Substances - Nature and Behaviour = 25 marks). 13 questions: 7 MCQ, 1 Assertion-Reason, 1 VSA(2m), 2 SA(3m), 1 case study(4m), 1 LA(5m). Internal choice in 1 SA, the case study, and the LA.

Q17. The following table shows the pH values of four solutions A, B, C and D on a pH scale (see figure: pH scale 1-14 with B at 7, C at 13, D at 3, A at 5). The solutions A, B, C and D respectively are of a : (A) Strong acid, weak acid, neutral, strong base (B) Weak acid, neutral, weak base, strong base (C) Weak acid, neutral, strong base, weak base (D) Weak acid, neutral, strong base, strong acid 1 mark



Q18. $C_6H_{12}O_6(aq) + 6O_2(g) \rightarrow 6CO_2(g) + 6H_2O(l)$. The above reaction is an example of - (A) Displacement Reaction (B) Endothermic Reaction (C) Exothermic Reaction (D) Neutralisation Reaction 1 mark

Q19. An iron nail is added to each of the two test tubes 'P' and 'Q' containing aqueous copper (II) sulphate, and aqueous silver nitrate respectively. Which of the following observation is correct? A. In test tube 'P' iron nail is coated with a blue coating and in test tube 'Q' there is no reaction. B. Iron nail is coated with a brown coating in test tube 'P' and silver coating in test tube 'Q'. C. There is no reaction in either of the test tubes 'P' or 'Q'. D. There is no reaction in test tube 'P' but a silver coating on iron nail is seen in test tube 'Q'. 1 mark

Q20. Four statements about the reactions of oxides with dilute hydrochloric acid and aqueous sodium hydroxide are listed. I. Aluminium oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide. II. Calcium oxide reacts with dilute hydrochloric acid and aqueous sodium hydroxide. III. Zinc oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide. IV. Sulphur dioxide does not react with either dilute hydrochloric acid or aqueous sodium hydroxide. Which statements are correct? A. I and II B. I and III C. II and IV D. III and IV 1 mark

Q21. An aqueous solution turns red litmus blue. Excess addition of which of the following solution would reverse the change? (A) Sodium hydroxide (B) Hydrochloric acid (C) Baking soda (D) Slaked lime 1 mark

Q22. Identify 'p', 'q' and 'r' in the following balanced reaction: p $Pb(NO_3)_2(s)$ --Heat--> q $PbO(s)$ + r $NO_2(g)$ + $O_2(g)$ A. 2,2,4 B. 2,4,2 C. 2,4,4 D. 4,2,2 1 mark

Q23. Carbon compounds: (i) are good conductors of electricity. (ii) are bad conductors of electricity. (iii) have strong forces of attraction between their molecules. (iv) have weak forces of attraction between their molecules. The correct statements are: (a) (i) and (ii) (b) (ii) and (iii) (c) (ii) and (iv) (d) (i) and (iii) — 1 mark

Q24. Assertion (A): C_4H_8, C_4H_6 and C_4H_{10} are members of the same homologous series. Reason (R): C_4H_8, C_4H_6, C_3H_4, C_3H_6, C_2H_4, C_2H_2 are unsaturated hydrocarbons. Options: 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. — 1 mark

Q25. Identify the type of each of the following reactions stating the reason for your answers. A. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe + heat$ B. $Pb(NO_3)_2 + 2KI \rightarrow PbI_2(down\text{-}arrow) + 2KNO_3$ — 2 marks

Q26. (i) Which method will be used to convert each of them to their respective metal oxides? (a) Carbonate ore (b) Sulphide ore. (ii) Write a chemical reaction to illustrate the use of aluminium for joining cracked railway tracks. (iii) During extraction of metals, electrolytic refining is used to obtain pure metals. Which material will be used as anode and cathode for the refining of copper metal by this process? — 3 marks

Q27. (i) The pH of a sample of tomato juice is 4.6. How is this juice likely to be in taste? Give reason to justify your answer. (ii) How do we differentiate between a strong acid and a weak base in terms of ion-formation in aqueous solutions? (iii) The acid rain can make the survival of aquatic animals difficult. How? — 3 marks

Q28. [case context] Sara added phenolphthalein to 2 mL dilute NaOH (turned pink), then added dilute H_2SO_4 drop by drop until colourless (40 drops needed); a drop of NaOH turned it pink again. Table: 2 mL NaOH -> 20 drops H_2SO_4; 3 mL -> 30 drops; 4 mL -> 40 drops. A. If Sara used concentrated H_2SO_4 in place of dilute H_2SO_4, how many drops will be required for the change in colour to be observed? (a) 40 (b) < 40 (c) > 40. Justify your answer. — 4 marks

Q29. (i) A carbon compound X is a good solvent. On reaction with sodium, X forms two products Y and Z. Z is used to convert vegetable oil into vegetable ghee. Identify and name X, Y and Z. Also write the equation of reaction of X with sodium to justify your answer. (ii) Write chemical equation to show what happens when ethanol: (I) burns in oxygen/air. (II) is heated at 443 K in excess conc. H_2SO_4. (III) reacts with acidified potassium dichromate. — 5 marks

Section C

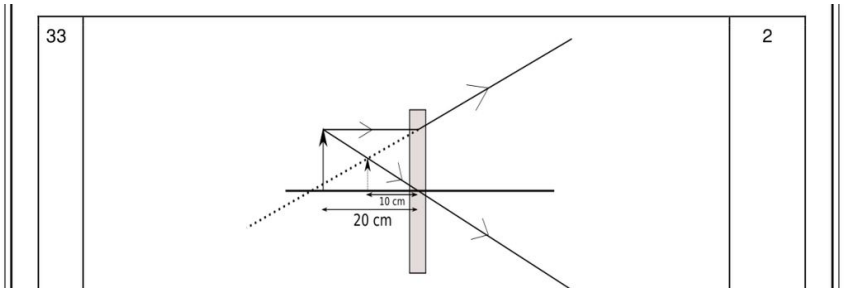
Physics (Natural Phenomena 12 + Effects of Current 13 = 25 marks). 10 questions: 2 MCQ, 1 Assertion-Reason, 2 VSA(2m), 3 SA(3m), 1 case study(4m), 1 LA(5m). Internal choice in 1 VSA, the case study, and the LA.

Q30. Arnav was making notes and he wrote down the following statements from his understanding of reflection from curved surfaces. I. Concave mirrors can produce both real and virtual images depending on the position of the object. II. Convex mirrors always produce real, inverted images regardless of the object's position. III. In both concave and convex mirrors, the image location can be determined using the mirror formula $1/f = 1/v + 1/u$ where f is the focal length, v is the image distance, and u is the object distance. Choose from the following the correct option that lists the correct statements about reflection from curved surfaces. A. I and II B. I, II and III C. II and III D. I and III — 1 mark

Q31. Choose the correct option from the below which explains the reason for us to perceive the day sky as blue. A. As sunlight passes through the atmosphere, shorter wavelengths, such as blue are scattered more than other colors. B. The sky appears blue because all colors are scattered equally, but blue light is stronger and more visible to the human eye. C. The blue color of the sky is due to longer wavelengths like red and orange scattering more than shorter wavelengths, making blue stand out more. D. The atmosphere contains blue-colored particles that give the sky its blue appearance. — 1 mark

Q32. Assertion (A): No two magnetic field lines are found to cross each other. Reason (R): The compass needle cannot point towards two directions at the point of intersection of two magnetic field lines. Select the correct answer: (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. — 1 mark

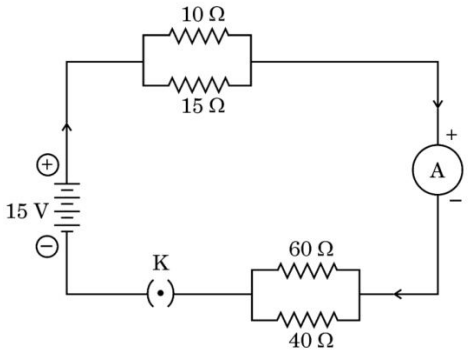
Q33. The given figure shows the formation of an image with an optical instrument (shown schematically as a rectangle); an upright object forms an image with the distances 10 cm and 20 cm marked. A. Identify the optical instrument (shown schematically as a rectangle) in the image. B. What type of image is formed in this case? C. Based on the measurements given in the image, calculate the focal length of the instrument. (For visually impaired students: A. Under what conditions can a convex lens form a virtual image? B. Why does a piece of paper catch fire if we allow sunlight to pass through a convex lens onto the paper?) — 2 marks



Q34. It is observed that the power of an eye to see nearby objects as well as far off objects diminishes with age. (i) Give reason for the above statement. (ii) Name the defect that is likely to arise in the eyes in such a condition. (iii) Draw a labelled ray diagram to show the type of corrective lens used for restoring the vision of such an eye. — 2 marks

Q35. Consider the following electric circuit (see figure: a 15 V source, 10 ohm and 15 ohm resistors in parallel, in series with a parallel combination of 60 ohm and 40 ohm resistors, an ammeter A and key K). Calculate the values of the following : (a) The total resistance of the circuit (b) The total current drawn from the source (c) Potential difference across the parallel combination of 10 ohm and 15 ohm resistors. 3 marks

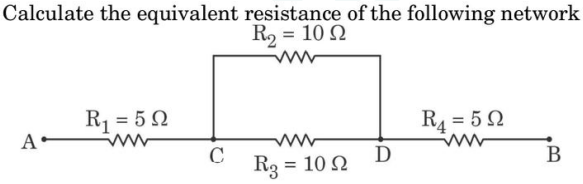
32. Consider the following electric circuit :



Calculate the values of the following : 3

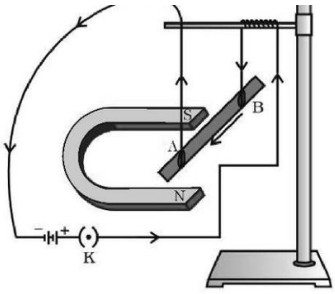
Q36. (a) Three resistors R_1, R_2 and R_3 are connected in parallel and the combination is connected to a battery, an ammeter, a voltmeter and a key. Draw suitable circuit diagram to show the arrangement of these circuit components along with the direction of current flowing. (b) Calculate the equivalent resistance of the following network: [network shown: along line A-C-D-B, R_1 = 5 ohm is between A and C and R_4 = 5 ohm is between D and B; between C and D, R_2 = 10 ohm (upper branch) and R_3 = 10 ohm (lower branch) are in parallel]. 3 marks

(b) Calculate the equivalent resistance of the following network : 3



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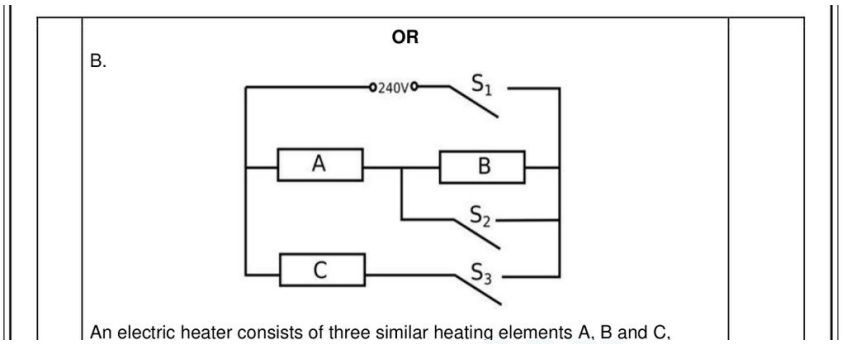
Q37. On the basis of the given circuit arrangement, answer the following questions: (a) What happens to the rod AB when the key K is closed and why? (b) Name and state the rule that determines this behaviour of the rod AB in the above situation. 3 marks



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Q38. An electric heater consists of three similar heating elements A, B and C, connected as shown in the figure (with switches S_1, S_2 and S_3 and a 240 V supply). Each heating element is rated as 1.2 kW, 240 V and has constant resistance. The circuit is connected to a 240 V supply. (i) Calculate the resistance of one heating element. (ii) Calculate the current in each resistor when only S_1 and S_3 are closed. (iii) Calculate the power dissipated across A when S_1, S_2 and S_3 are closed. (For visually impaired students: A. (i) Explain why in household circuits only the fuse is connected in series with all the rest of the appliances but all appliances are connected in parallel to each other. (ii) A 1500 W heater and a 500 W fan are connected in parallel to a 220 V supply with a 10 A fuse; (a) calculate the total current drawn and (b) determine whether the 10 A fuse will blow. OR B. Two resistors R_1=6 ohm and R_2=12 ohm are connected in parallel to a 24 V battery for 5 minutes; (i) calculate the total heat generated and (ii) if each resistor is rated 100 W, determine whether it is safe.) 4 marks



An electric heater consists of three similar heating elements A, B and C.

Q39. (i) The power of a lens 'X' is -2.5 D. Name the lens and determine its focal length in cm. For which eye defect of vision will an optician prescribe this type of lens as a corrective lens ? (ii) "The value of magnification 'm' for a lens is -2." Using new Cartesian Sign Convention and considering that an object is placed at a distance of 20 cm from the optical centre of this lens, state: (I) the nature of the image formed; (II) size of the image compared to the size of the object; (III) position of the image, and (IV) sign of the height of the image. (iii) The numerical values of the focal lengths of two lenses A and B are 10 cm and 20 cm respectively. Which one of the two will show higher degree of convergence/divergence ? Give reason to justify your answer. 5 marks

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