



National Level Examination
NLE 2024

SCIENCE

Grade 10

Subject Code:

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Total Questions: 50

Time: 1 hour

DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED TO DO SO

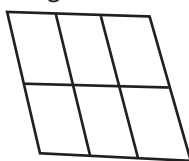
- All questions are compulsory.
- Read the instructions on the **ANSWER SHEET** and fill in your **NAME, CLASS** and **OTHER INFORMATION**.
- To mark your choice of answer by darkening the circles in the **ANSWER SHEET**, use a **BLUE/BLACK BALLPEN** only.
- You **MUST** record your answers on the **ANSWER SHEET** only.
- There are **50 MULTIPLE CHOICE QUESTIONS**. Use the information provided to choose the **BEST** possible answer among the four options. On your **ANSWER SHEET** fill in the circle that matches your answer.
- **$\frac{1}{2}$ MARK** will be deducted for every **WRONG ANSWER**.
- Return the **ANSWER SHEET** to the invigilator at the end of the examination.
- You are **NOT** allowed to use a calculator. You may use a ruler and spare paper for rough work.



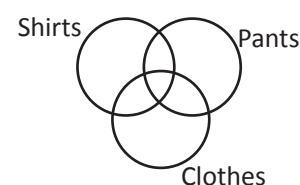
This question paper contains a total of 50 questions divided into three sections—A, B and C.
Read the instructions carefully before attempting these questions.

Section A (Logical Reasoning)

- If PINK is coded as 1581310, then code for BLUE is _____.
 (A) 112315 (B) 111204
 (C) 111315 (D) 112424
- Eight friends Gauri, Hina, Ishika, Jaya, Neeraj, Omi, Payal and Sumi are sitting in a straight line, but not necessarily in the same order. Hina sits second to right of Omi. Omi sits at one of the extreme ends of the line. Only three people sit between Hina and Neeraj.
 Ishika sits third to the left of Jaya. Only two people sit between Jaya and Gauri. Payal is not an immediate neighbour of Neeraj.
 Who amongst the following represents the person seated at the extreme right end of the line?
 (A) Payal (B) Sumi
 (C) Omi (D) Gauri
- The letters P, Q, R, S, T, U and V, not necessarily in that order, stand for seven consecutive integers from 1 to 7.
 (i) S is 3 less than P. (ii) Q is the middle term.
 (iii) U is as much less than Q as R is greater than S. (iv) V is greater than U and T is less than S.
 The fifth integer is _____.
 (A) P (B) R
 (C) S (D) T
- How many parallelograms are present in the given figure?



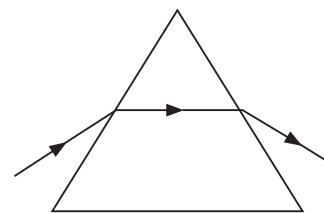
- (A) 20 (B) 18
(C) 16 (D) 16
- Which of the following statements is/are true according to the given Venn diagram?
 (i) Some shirts are pants.
 (ii) Some pants are clothes.
 (iii) All clothes that are shirts are pants.
 (iv) Some clothes are pants but not shirts.
 (A) Only i and ii (B) Only III
 (C) i, ii and iv (D) All of these
 - Five friends went to a restaurant to have dinner and decided to pay equally the bill. When the bill was presented, one among them fell short of his share by ₹ 60. So the other friends divided it among themselves and each of them had to pay ₹ 130. What was the amount presented in the bill?
 (A) 610 (B) 590
 (C) 600 (D) 575
 - Count the number of such 9's in the following number series, which are immediately preceded by 3 and followed by 6.
 3 9 6 9 3 9 3 9 3 9 6 3 6 3 9 5 6 9 5 6 9 3 9 6 3 9
 (A) Nil (B) 2
 (C) 3 (D) 4



8. In the word ORGANISATIONAL, if the first and second, third and fourth, fifth and sixth words are interchanged up to the last letter, then what would be the tenth letter from right?
- (A) I (B) N
(C) T (D) S
9. Pointing towards a lady in a photograph, a girl said, "She is the sister of my mother's husband". How is the girl related to the lady?
- (A) Daughter (B) Sister
(C) Niece (D) Wife
10. Complete the given pattern.
POQ, SRT, VUW, ?
- (A) XYZ (B) XZY
(C) YXZ (D) YZX

Section B (Subject Specific)

11. Sheela visited a doctor, and came to know that she was suffering from scurvy disease and was suggested to take acid for treating this disease. Which one of the given acids can be used in the treatment of scurvy diseases?
- (A) Acetic acid (B) Hydrochloric acid
(C) Ascorbic acid (D) Nitric acid
12. Which is the most important safety method that can protect our home appliances from overloading or short-circuiting?
- (A) Stabiliser (B) Electric meter
(C) Fuse (D) Earthing
13. A ray of light enters glass prism, as shown in figure, of refractive index 1.5. What is the speed of light inside the prism?
- (A) $0.2 \times 10^8 \text{ ms}^{-1}$ (B) $2 \times 10^9 \text{ ms}^{-1}$
(C) $2 \times 10^7 \text{ ms}^{-1}$ (D) $2 \times 10^8 \text{ ms}^{-1}$



14. Read the given statements and select the correct option.

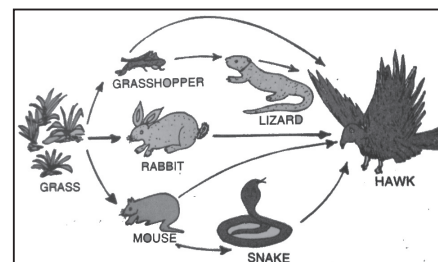
Assertion (A): In the day time, CO_2 generated during respiration is used up for photosynthesis.

Reason (R): There is no net release of CO_2 in the environment by plants during day.

- (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.
15. Match the following columns and select the correct option:
- | Column I | Column II |
|---------------------|---------------------------|
| (p) Ozone depletion | (i) Plants |
| (q) Global warming | (ii) Multiple food chains |
| (r) Producer | (iii) CO_2 |
| (s) Top carnivore | (iv) CFC |
| (t) Food Web | (v) Lion |
- (A) (p)-(iii), (q)-(iv), (r)-(i), (s)-(ii), (t)-(v) (B) (p)-(iv), (q)-(iii), (r)-(v), (s)-(ii), (t)-(i)
(C) (p)-(iv), (q)-(iii), (r)-(i), (s)-(v), (t)-(ii) (D) (p)-(iv), (q)-(iii), (r)-(ii), (s)-(v), (t)-(i)



16. Choose the correct statement.
- The speed of light increases when it travels from air into water.
 - When light changes its medium of propagation, then both wavelength and speed changes.
 - Refractive index of a transparent medium is the ratio of the speed of light in vacuum to its speed in the given medium.
 - The refractive index can be greater than, equal to or less than one.
- (A) (i) and (ii) (B) (iii) and (iv)
(C) (ii) and (iii) (D) (i) and (iv)
17. Which endocrine gland slowly diminishes in size with the advancement of age in human?
- (A) Adrenal (B) Thymus
(C) Pineal (D) Pituitary
18. Cataract is the condition where the crystalline lens of people at old age that becomes milky and cloudy. This causes partial or complete loss of vision. It is possible to restore vision through _____.
- (A) convex lens (B) concave lens
(C) surgery (D) None of these
19. Shruti went to visit Qutab Minar with her mother. She can see the full length of Qutab Minar by using _____.
- (A) a concave mirror (B) a convex mirror
(C) a plane mirror (D) Both (A) and (C)
20. What is the melting point of tungsten?
- (A) 2700 C (B) 1000 C
(C) 3380 C (D) 2000 C
21. How much work is done in moving a charge of 5 C across two points having a potential difference 15 V?
- (A) 55 J (B) 25 J
(C) 35 J (D) 75 J
22. Read the food web carefully.
- Which of the following would lead to increase in the mouse population?
- Increase in population of grasshopper
 - Decrease in grass population
 - Decrease in population of lizard
 - Decrease in population of hawk
- (A) (i) and (ii) only (B) (iii) only
(C) (iv) only (D) All of these
23. Which of the following displacement reactions is used for welding of railway tracks?
- (A) $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$ (B) $\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$
(C) $\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$ (D) None of these
24. Which of the following is not a redox reaction?
- (A) $\text{H}_2\text{SO}_4 + 2\text{HBr} \rightarrow \text{SO}_2 + \text{Br}_2 + 2\text{H}_2\text{O}$ (B) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
(C) $\text{PbO}_2 + 4\text{HCl} \rightarrow \text{PbCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$ (D) $\text{V}_2\text{O}_5 + 5\text{Ca} \rightarrow 2\text{V} + 5\text{CaO}$
25. The pH of three solutions X, Y, and Z is 6, 4 and 8 respectively. Which of the following is the correct order of their basic strength?
- (A) $X > Y > Z$ (B) $Z > X > Y$
(C) $Z > Y > X$ (D) $Y > X > Z$



26. Which of the following general formula represent the alkenes group?
- (A) $C_n H_{2n}$ (B) $C_n H_{2n-2}$
(C) $C_n H_{2n+2}$ (D) $C_n H_{2n+1}$
27. What is the ionic equation for the neutralization reaction of aqueous sodium hydroxide and dilute sulphuric acid?
- (A) $H^+ + OH^- \rightarrow H_2O$ (B) $NaOH + H^+ \rightarrow Na^+ + H_2O$
(C) $H_2SO_4 + OH^- \rightarrow H_2O + SO_4^{2-}$ (D) $Na^+ + H_2SO_4 \rightarrow Na_2SO_4 + H^+$
28. If the object is placed at a distance of 30 cm from plane mirror, then the image formed is away from the object.
- (A) 15 m (B) 50 m
(C) 60 m (D) 100 m
29. In which part of the human eye is the image of an object formed?
- (A) Iris (B) Pupil
(C) Retina (D) Cornea
30. Two pink coloured flowers on crossing resulted in 1 red, 2 pink and 1 white flower progeny. The nature of the cross will be
- (A) Double fertilisation (B) Cross fertilisation
(C) Self pollination (D) No fertilization
31. Which of the following are exothermic processes?
- (i) Reaction of water with quick lime (ii) Dilution of an acid
(iii) Evaporation of water (iv) Sublimation of camphor
(A) (i) and (ii) (B) (ii) and (iii)
(C) (iii) and (iv) (D) (i) and (iv)
32. The table given below shows the volume, concentration and pH of two acids.

Acids	Volume and Concentration	pH
HCl	50 cm ³ of 1 mol dm ⁻³	1
CH ₃ COOH	50 cm ³ of 1 mol dm ⁻³	4

Why is there a difference in pH value between the two acids?

- (A) Number of moles of ethanoic acid is less than that of hydrochloric acid.
(B) Ethanoic acid is more soluble in water than hydrochloric acid.
(C) The degree of ionisation of ethanoic acid is less than that of hydrochloric acid.
(D) The concentration of hydrogen ion is higher in ethanoic acid than in hydrochloric acid.
33. Which of the following characters is common in the ores of different metals?
- (A) They are all oxides. (B) They are all sulphides.
(C) They are all minerals. (D) They are all black in colour.
34. Given below are the commonly seen features in adult males. Which hormone is responsible for these features?
- (i) Appearance of moustache (ii) Cracking of voice
(iii) Presence of Adam's apple.
(A) Testosterone (B) Estrogen
(C) Progesterone (D) Oxytocin
35. Read the following statements and choose the correct ones:
- (i) Regeneration and vegetative propagation are types of asexual reproduction.
(ii) Spore formation occurs during sexual reproduction.
(iii) Fission means the division of a parent organism into two daughter organisms.
(iv) Sexual reproduction leads to variation.

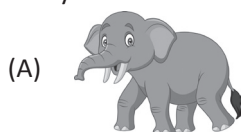


- (A) (i), (ii) and (iii)
(C) (i), (iii) and (iv)

- (B) (ii), (iii) and (iv)
(D) (i), (ii) and (iv)

Instruction: Q. 36 to 40 are two-key based questions having four options A, B, C and D out of which TWO are correct.

36. Aqua regia is a highly corrosive, fuming liquid. It is one of the few reagents that is able to dissolve _____.
(A) Gold (B) Lead
(C) Platinum (D) Bronze
37. Choose the correct options.
(A) Emf of a cell is the minimum potential difference.
(B) Kilowatt hour is the unit of electrical energy.
(C) Emf and potential difference is same for an electrical cell in an open circuit.
(D) Kilowatt is the SI unit of power.
38. Which of the following properties of a proton can change when it moves freely in a magnetic field?
(A) Speed (B) Velocity
(C) Momentum (D) Charge
39. Which of the following statements are correct?
(A) Leishmania that causes kala-azar have a whip-like structure at one end of the cell.
(B) In Amoeba, the splitting of the two cells during division can take place only in one plane.
(C) Plasmodium also known as malarial parasite, divide into many daughter cells simultaneously by multiple fission.
(D) Multi-cellular organisms, use very simple ways of reproduction.
40. A few organisms are given below. Which of the organisms may belong to the third trophic level in a food chain of a forest ecosystem?



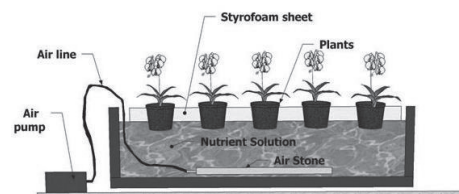
Section C (Competency Based/PISA Based)

41. Select the INCORRECT statement about sexual reproduction in flowering plant.
(A) When the transfer of pollen from stamen to stigma occurs in the same flower, it is referred to as self-pollination.
(B) The transfer of pollen in cross pollination is achieved by agents like wind, water or animal.
(C) After the pollen lands on a suitable stigma, it has to reach the male germ-cells which are in the ovary.
(D) Both (A) and (B)
42. A blue colour flower plant denoted by BB is cross-bred with that of white colour flower plant denoted by bb. What must be the percentage of white flower plants in F_2 generation if flowers of F_1 plants are self-pollinated?
(A) 50% (B) 10%
(C) 2.5% (D) 25%
43. Which of the following is the phenotype ratio of the F_2 generation in dihybrid crosses?
(A) 1:3:1 (B) 1:2:1
(C) 9:3:3:1 (D) 1:3:3:1

44. Magic mirror is a combination of 3 different types of mirrors and a child is standing one feet away from it. He found his head smaller, middle portion bigger and legs of same size. What type of mirrors are used in this magic mirror from top to bottom?
- (A) Concave → Convex → Plane (B) Convex → Plane → Concave
(C) Plane → Concave → Convex (D) Convex → Concave → Plane
45. A man with myopic eye cannot see objects at distance more than 50 cm from his eye. What power of lens should he use?
- (A) 1 D (B) -1 D
(C) 2 D (D) -2 D
46. Read the following statements and select the correct option.
Statement-1: When we increase the diameter of a copper wire, its specific resistance increases.
Statement-2: Specific resistance is independent of the cross-sectional area of the wire used.
- (A) Statement-1 is correct and statement-2 is incorrect.
(B) Statement-1 is incorrect and statement-2 is correct.
(C) Both the statements are correct, but statement-2 is the correct explanation of statement-1.
(D) Both the statements are correct and statement-2 is not the correct explanation of statement-1.
47. Suman observed that the stain of curry on a white dress becomes reddish-brown when soap is scrubbed on it, but it turns yellow again when the white dress is washed with plenty of water. Which of the following might be the best reason for her observation?
- (A) Soap is acidic in nature.
(B) Soap is basic in nature.
(C) Turmeric is a natural indicator that gives a greenish tinge in acids.
(D) Turmeric is a natural indicator that gives a reddish tinge in acids.
48. Red light is utilized for signal lights so that it may be seen even in deep fog or haze. What is the best reason for this?
- (A) Red light has the longest wavelength.
(B) It is scattered the least when it moves through the air medium.
(C) It does not deviate much due to dispersion.
(D) All of these

Read the given information and answer the following PISA based questions:

49. Hydroponics is a way of growing plants without soil. The plants grow in an insoluble porous material, e.g. sand, which is regularly soaked with water. Water is pumped through the system four to six times a day depending on plant type. Once the pumping stops, any excess water drains away and collects in the water storage tank.



Studies have shown that plants grown hydroponically use less water than plants grown in soil. A key reason for this lies in the design of hydroponics systems. What feature of the hydroponics system saves water compared to plants grown in soil?

- (A) The porous material holds the water in the growing trough.
(B) Unused water is conserved in the tank, and recirculates through the system over and over.
(C) Plants watered at regular intervals absorb less water.
(D) Water flow over the roots cools the plant, so the plant uses less water.
50. Which statement explains why daylight and darkness occur on Earth?
- (A) The Earth rotates on its axis. (B) The Sun rotates on its axis.
(C) The Earth's axis is tilted. (D) The Earth revolves around the Sun.

