



ORANGE GLOBAL OLYMPIAD

# SCIENCE

## Grade 9

National Level Examination  
NLE 2025

Subject Code: 

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Total Questions: 50

Total Marks: 50

Time: 1 hour

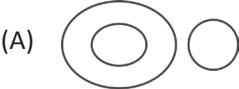
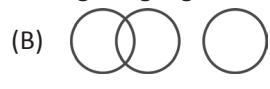
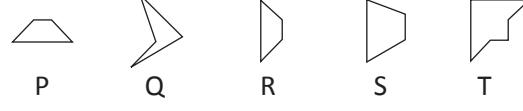
### DO NOT OPEN THIS BOOKLET UNTIL INSTRUCTED TO DO SO

- 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 BALL-POINT PEN** only.
- You **MUST** record your answers on the **ANSWER SHEET** only.
- There are **50 MULTIPLE CHOICE QUESTIONS**. Each question carries one mark. Use the information provided to choose the **BEST** possible answer among the four options. On your **ANSWER SHEET** darken 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)

- Today is Monday. Which day will it be after 23 days?  
 (A) Tuesday  
 (B) Monday  
 (C) Sunday  
 (D) Wednesday
- If – means  $\times$ ,  $\times$  means  $+$ ,  $+$  means  $\div$  and  $\div$  means  $-$ , then  $40 \times 12 + 3 - 6 \div 60 = ?$   
 (A) 8  
 (B) 16  
 (C) 4  
 (D) 24
- Identify the correct set which can fill the missing place.  
 S H A P E : \_\_\_\_\_ :: M A I Z E : Z I A M E  
 (A) P A H S E  
 (B) A H P S E  
 (C) H P A S E  
 (D) S P A H E
- Rohit is facing East. He turns to the right and goes 20 metres, then turns to the left and goes 20 metres. Next, he turns to the right and goes 20 metres, then again turns to the right and goes 40 metres. Finally, Rohit goes 40 metres to the right. In which direction is Rohit from his original position?  
 (A) North  
 (B) South  
 (C) East  
 (D) West
- Select the correct diagram that illustrates the relationship among Languages, French, German.  
 (A)   
 (B)   
 (C)   
 (D) 
- A mother is three times as old as her son. In coming 10 years, she will be twice as old as him. What will be the current ages of the mother and son?  
 (A) Mother: 30, Son: 10  
 (B) Mother: 36, Son: 12  
 (C) Mother: 21, Son: 7  
 (D) Mother: 45, Son: 15
- Complete the following series.  
 7, 28, 49, 70, 91, 112, ?  
 (A) 135  
 (B) 134  
 (C) 133  
 (D) 130
- Select the option which represents three out of the five alternative figures which when fitted into each other would form a complete square.  
  
 (A) Q T P  
 (B) P R T  
 (C) R S T  
 (D) P R S
- Sunita ranked 11<sup>th</sup> from the top and 27<sup>th</sup> from the bottom in a class. How many students are in the class?  
 (A) 38  
 (B) 28  
 (C) 39  
 (D) 37
- Select the correct group of symbols that fit in the given equation.  

$$5 \underline{\quad} 3 \underline{\quad} 8 \underline{\quad} 4 \underline{\quad} 2 = 21$$
  
 (A)  $\times, +, -, \div$   
 (B)  $- , \times, +, \div$   
 (C)  $+, \times, +, \div$   
 (D)  $+, \times, -, \div$



## Section B (Subject Specific)

11. When 3 g of carbon is burnt in 8 g of oxygen, 11 g of  $\text{CO}_2$  is produced. What mass of  $\text{CO}_2$  will be formed when 3 g of carbon is burnt in 50 g of oxygen?

(A) 39 g (B) 45 g  
(C) 53 g (D) 11 g

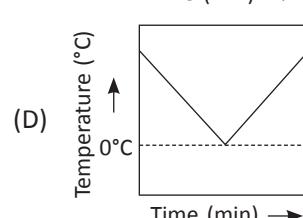
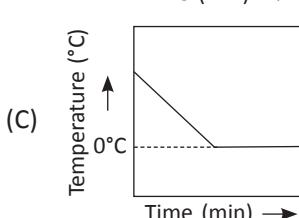
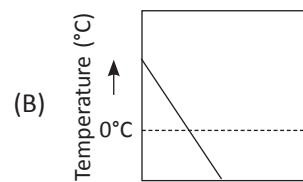
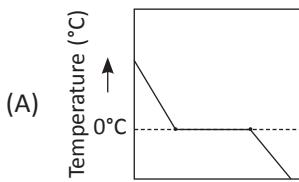
12. Which of the following correctly explains the concept of plasmolysis in plant cells?

(A) The process where the cell wall collapses due to high external osmotic pressure.  
(B) The shrinkage of the protoplasm away from the cell wall when placed in a hypertonic solution.  
(C) The bursting of the cell wall due to excessive intake of water.  
(D) The diffusion of water molecules from a region of higher concentration to a region of lower concentration.

13. A ball is thrown vertically upwards with a velocity of  $10 \text{ m s}^{-1}$ . The maximum height it can reach is \_\_\_\_\_.  
[Given that acceleration due to gravity,  $g = 10 \text{ m s}^{-2}$ ]

(A) 10 m (B) 5 m  
(C) 15 m (D) 20 m

14. A glass tumbler containing hot water is kept in the freezer compartment of a refrigerator (temperature  $< 0^\circ\text{C}$ ). If you could measure the temperature of the content of the tumbler, which of the following graphs would correctly represent the change in its temperature as a function of time?



15. Read the following statements and select the correct option.

**Statement-1:** Pressure is a vector quantity.

**Statement-2:** Pressure depends on force which is a vector quantity.

(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 incorrect. (D) Both the statements are correct.

16. An active meristematic cell possesses \_\_\_\_\_.  
(A) Dense cytoplasm, vacuoles and a nucleoid  
(B) Thick cellulose walls, vacuoles and a nucleus  
(C) Dense cytoplasm, thin cellulose walls and a prominent nucleus  
(D) Vacuoles and a great amount of food reserve

17. Weeds should be removed from cultivated fields during the early stages of crop growth because \_\_\_\_\_.  
(A) These get mixed with crop to upgrade its fertility  
(B) They help with the pollination of crops  
(C) They compete for nutrients, water, space and light  
(D) They enhance the nutrient content of the soil



18. Match the Column I with Column II and select the correct option.

Column I (Terms)	Column II (Discoverers)
(P) Nucleus	(i) Thomson
(Q) Electron	(ii) Goldstein
(R) Neutron	(iii) Rutherford
(S) Canal Rays	(iv) Chadwick

	P	Q	R	S
(A)	(ii)	(i)	(iv)	(iii)
(B)	(iii)	(i)	(iv)	(ii)
(C)	(iii)	(iv)	(i)	(ii)
(D)	(ii)	(iv)	(i)	(iii)

19. Which of the following is the true example of Newton's third law of motion?

(A) When a man jumps out of a boat, the boat moves backwards.  
 (B) A rubber ball rebounds when struck against a hard floor.  
 (C) The working of rockets and jet aeroplanes.  
 (D) All of these

20. Select the correct option that will show Tyndall effect.

(A) Salt solution (B) Copper sulphate solution  
 (C) Sugar solution (D) Milk

21. An object has a weight of 12 N in air. When it is completely immersed in water, its weight decreases to 9 N. The weight of the liquid displaced by the object is \_\_\_\_\_.

(A) 3 N (B) 9 N  
 (C) 12 N (D) 21 N

22. Chemical formula of few compounds are given below:

Zinc phosphate -  $Zn_3(PO_4)_2$   
 Magnesium nitride -  $Mg_3N_2$

Lead bromide -  $PbBr_2$   
 Aluminium nitride -  $AlN$

Based on the formula, the valencies or charges on the ions are written below. Mark the incorrect option.

(A) Phosphate ion, -3 (B) Bromide ion, -2  
 (C) Nitride ion, -3 (D) Aluminium ion, +3

23. A human red blood cell is placed in a strong salt solution. In which direction does water move and what is the effect on the cell?

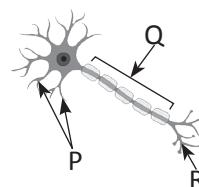
Movement of water	Effect on cell
(A) Into the cell	Slight increase in size
(B) Out of the cell	Cell shrinks
(C) Out of the cell	Slight increase in size
(D) Into the cell	No change in cell volume

24. A bag containing wheat weighs 500 kg. At what height should it be stored so that its potential energy is 19,600 J?  
 (Given:  $g = 9.8 \text{ ms}^{-2}$ )

(A) 2 m (B) 3 m  
 (C) 4 m (D) 5 m

25. Based on your knowledge of nerve cell structure, identify the labellings P, Q and R in the given figure.

P	Q	R
(A) Axon	Dendrites	Nerve endings
(B) Dendrites	Axon	Nerve endings
(C) Nerve endings	Axon	Dendrites
(D) Nerve endings	Dendrites	Axon





26. A body weighs 80 kgwt on the surface of the Earth. How much will it weigh on the surface of another planet whose mass is 1/8 th and the radius is half that of the Earth?

(A) 30 kgwt (B) 35 kgwt  
(C) 40 kgwt (D) 45 kgwt

27. Hydrogen exists in three isotopic forms,  $^1_1\text{H}$ ,  $^2_1\text{H}$ ,  $^3_1\text{H}$  known as protium, deuterium and tritium respectively. Why are all isotopes neutral in nature?

(A) Since neutrons are neutral, isotopes are electrically neutral.  
(B) All isotopes have one electron and one proton, hence they are neutral.  
(C) All isotopes have one proton and one neutron, hence they are neutral.  
(D) An increasing number of protons in the isotopes make them neutral.

28. Waves with a frequency of 220 Hz are produced in the air. If the speed of sound in air is  $330 \text{ m s}^{-1}$ , what will be its wavelength?

(A) 1.5 m (B) 0.375 m  
(C) 0.038 m (D) 0.187 m

29. What is the work to be done to increase the velocity of a car from 30 km/h to 60 km/h, if the mass of the car is 1500 kg?

(A) 156250 J (B) 16000 J  
(C) 18320 J (D) 16321 J

30. Two solids, X and Y, were mixed thoroughly in powdered form and heated in a China dish to form a new substance Z. Which of the following statements regarding the reaction is correct?

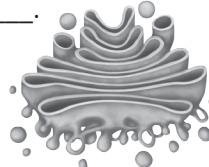
(A) Z retains the properties of X and Y. (B) X and Y can be separated from Z by physical methods.  
(C) Z has a fixed composition. (D) Z is a homogeneous mixture.

31. Identify the mismatched pair from the following.

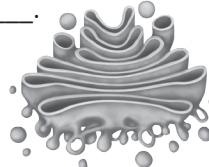
(A) Parenchyma - Intercellular spaces (B) Muscular tissue - Contractile proteins  
(C) Xylem - Simple permanent tissue (D) Sclerenchyma - Thick, lignified walls

32. Which of the following is necessary condition for the formation of echoes?

(A) The intensity of sound should be low.  
(B) The obstacle that reflects sound wave should be shiny or polished.  
(C) The minimum distance between the source of sound and the reflecting body should be 17.2 m.  
(D) All of these

33. The cell organelle shown in the given figure is directly involved in the formation of \_\_\_\_\_. 

(A) Nucleus (B) Endoplasmic reticulum  
(C) Chromosomes (D) Lysosomes

34. An inflated balloon shrinks when kept in the refrigerator. This happens because of \_\_\_\_\_. 

(A) The movement of particles decreases and they come closer  
(B) Particles contract due to high temperature  
(C) Particles expand due to low temperature  
(D) The movement of particles increases, causing them to move apart.

35. Which of the following physical quantities have the same units?

(A) Speed and acceleration (B) Force and work  
(C) Force and pressure (D) Work and energy

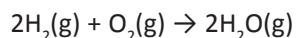
**Instruction: Q.36 to 40 are two-key based questions having four options A, B, C and D out of which TWO are correct.**

36. Two identical packets are dropped from aeroplanes from the same height at the equator and at north pole of the earth. Identify the correct statements.

(A) The packet will fall slowly at equator. (B) The packet will fall slowly at north pole.  
(C) The value of 'g' is less at equator. (D) The value of 'g' is less at north pole.



37. For the given equation, one mole of hydrogen was burnt with one mole of oxygen. What will we get after the completion of the reaction?



(A) 1 mole of steam (B) 0.5 mole of  $\text{O}_2$   
(C) 0.5 mole of  $\text{H}_2$  (D) 2 moles of steam

38. Which of the following options are incorrect about the cell organelle shown in the given figure?

(A) Found in all types of cells (B) Contains chlorophyll  
(C) Known as the powerhouse of the animal cell (D) Contains DNA

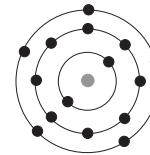


39. Which of the following statements about displacement are correct?

(A) It is a vector quantity. (B) It is a scalar quantity.  
(C) It may be positive, negative or zero. (D) It depends only on the path taken.

40. What would this element's valency be on the basis of given atomic structure?

(A) 2 (B) 3  
(C) 4 (D) 5



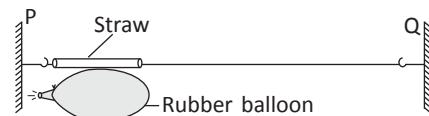
### Section C (Competency Enhancement)

41. Which of the given statements are correct regarding Rutherford's alpha-particle scattering experiment?

(i) An atom has a negatively charged centre.  
(ii) Nearly all the mass of an atom is concentrated in the nucleus.  
(iii) The electrons revolve around the nucleus in circular paths.  
(iv) Most of the space inside the atom is empty.  
(A) (i) and (iii) only (B) (ii) and (iii) only  
(C) (iii) and (iv) only (D) (ii), (iii) and (iv) only

42. A big rubber balloon is inflated and perfectly tied with a thread. It is then fixed to a straw attached to a string, as shown in the given figure. In which direction will the straw move and the air will escape from the balloon, when the mouth of the balloon is opened?

(A) Straw and air both will move from P to Q.  
(B) Air will move towards P and the straw will move towards Q.  
(C) Straw and air both will move from Q to P.  
(D) None of these.



43. Which of the following is true about the components of blood P, Q and R in the given figures?

(A) P-Transports oxygen, Q-Kills bacteria, R-Clots blood  
(B) P-Transports carbon dioxide, Q-Produces antibodies, R-Contains haemoglobin  
(C) P-Transports bacteria, Q-Eats foreign material, R-Clots blood  
(D) P-Transports food, Q-Releases heparin, R-Clots blood



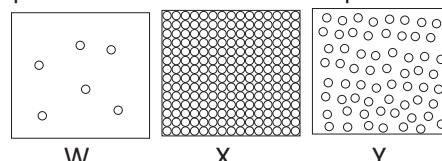
44. Which of the following correctly describes the relationship between muscle contraction and bone movement?

(A) Smooth muscles contract and pull the tendons to move the bones.  
(B) Smooth muscles contract and pull the ligaments to move the bones.  
(C) Skeletal muscles contract and pull the tendons to move the bones.  
(D) Skeletal muscles contract and pull the ligaments to move the bones.

45. Ananya is carrying a school bag that weighs 4 kg on her back and walks 300 m along a flat road. The work done against gravitational force will be \_\_\_\_\_. ( $g = 10 \text{ m/s}^2$ )

(A)  $12 \times 10^3 \text{ J}$  (B) 1200 J  
(C) 12 J (D) zero

46. Diagrams W, X and Y show how the particles of a substance are packed at different temperatures.



The given graph shows the temperature changes which occur on heating a substance. In which region of the graph would all the particles of the substance be packed as shown in Y?

(A) (i) (B) (ii)  
(C) (iii) (D) (iv)

47. A science teacher gave different mixtures to four groups (M, N, O, and P) of students to separate their components. Which group was not following the correct method?

(A) Group M was separating a mixture of ammonium chloride and sodium chloride by sublimation.  
(B) Group N was separating a mixture of ethyl alcohol and water using a separating funnel.  
(C) Group O was separating a mixture of iron pins and sand using a magnet.  
(D) Group P was separating fine mud particles suspended in water by filtration.

48. A block of mass 10 kg and dimensions  $30\text{ cm} \times 20\text{ cm} \times 10\text{ cm}$  is kept on a table in two different positions (i) and (ii). The ratio of pressures exerted in positions (i) and (ii) will be \_\_\_\_\_.

(A) 2 : 1 (B) 3 : 2  
(C) 2 : 3 (D) 1 : 2

49. Select the incorrect statements regarding manure.

(i) It contains significant amounts of nutrients but only small amounts of organic matter.  
(ii) It helps in draining out excess water from clayey soil.  
(iii) It enhances the water-holding capacity of sandy soil.  
(iv) Its overuse can pollute the environment as it can cause eutrophication.  
(A) (i) and (ii) only (B) (i) and (iv) only  
(C) (i) and (iii) only (D) (iii) and (iv) only

50. Observe the graphs given in Column I and match them with the information given in Column II.

Column I	Column II
(P)	(i) Non-uniform motion
(Q)	(ii) Object at rest
(R)	(iii) Constant velocity
(S)	(iv) Uniform acceleration

(A) (P) – (ii), (Q) – (i), (R) – (iv), (S) – (iii)  
(C) (P) – (i), (Q) – (iii), (R) – (iv), (S) – (ii)

(B) (P) – (ii), (Q) – (iv), (R) – (i), (S) – (iii)  
(D) (P) – (i), (Q) – (iv), (R) – (ii), (S) – (iii)

