NSMC 2026 · QUESTION PAPER

National Science and Math Championship

Where Curiosity meets Competition

Conducted by XandY Learning

GRADE 09

GRADE	TOTAL QUESTIONS	MAXIMUM MARKS	MARKING SCHEME
09	40 MCQs	160	+4 / −1

GENERAL INSTRUCTIONS

1. This question paper contains 40 multiple-choice questions.
2. Each correct answer carries 4 marks.
3. One mark will be deducted for every incorrect answer.
4. Choose the most appropriate answer from the four options.

PAPER PATTERN

SEC.	SUBJECT	Q. NO.	QS	MARKS
A	Mental Ability	1–8	8	32
B	Physics	9–16	8	32
C	Chemistry	17–24	8	32
D	Biology	25–32	8	32
E	Mathematics	33–40	8	32
	Total	**1–40**	**40**	**160**

SECTION A — Mental Ability

Questions 1–8 · 8 × 4 = 32 marks

1. If FRIEND is coded as IRFDNE, how is CASTLE coded?

A) SACELT **B)** ELTSAC **C)** TLECAS **D)** SACTLE

2. A clock shows 2:15. What time does the mirror image of its mirror image show?

A) 9:45 **B)** 10:45 **C)** 3:45 **D)** 2:15

3. 8 : 28 :: 27 : ?

A) 64 **B)** 65 **C)** 81 **D)** 37

4. The present ages of A, B and C are in the ratio 3:4:5. After 6 years, the sum of their ages will be 90 years. What was the age of B four years ago?

A) 18 years **B)** 20 years **C)** 22 years **D)** 24 years

5. If P means ÷, Q means ×, R means + and S means −, then 24 P 4 Q 3 R 8 S 6 = ?

A) 18 **B)** 20 **C)** 26 **D)** 14

6. Find the odd pair.

A) Dog : Puppy **B)** Cow : Calf **C)** Horse : Foal **D)** Goat : Lamb

7. AZ, CX, FU, JQ, ___

A) OL **B)** OM **C)** PL **D)** PK

8. Consider the following relationships:

- M is the father of N.
- N is the mother of O.
- O is the brother of P.
- P is the mother of Q.
- Q is the sister of R.

How is M related to R?

A) Maternal grandfather **B)** Maternal great-grandfather
C) Paternal grandfather **D)** Paternal great-grandfather

SECTION B Physics

Questions 9–16 · 8 × 4 = 32 marks

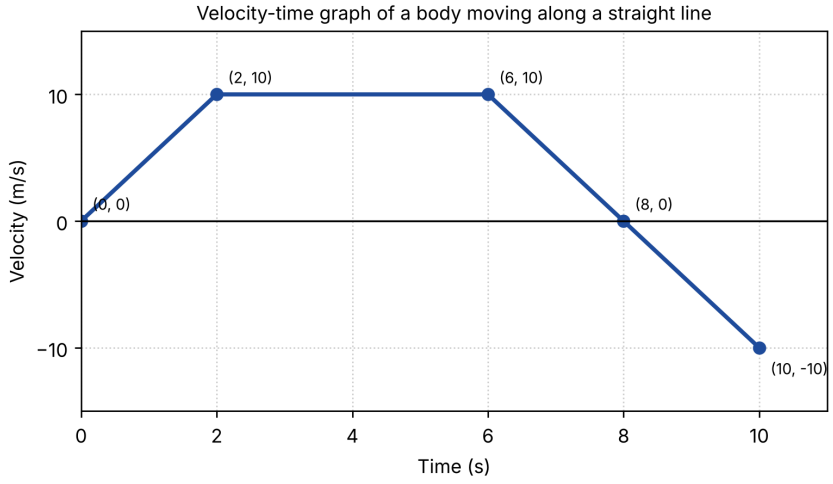
9. A rectangular coil of 20 cm × 10 cm is placed in a uniform magnetic field of 0.3 T, perpendicular to its surface. What is the magnetic flux through the coil?

A) 0.06 Wb **B)** 0.006 Wb **C)** 0.6 Wb **D)** 0.0006 Wb

10. In a hydraulic press, the small piston has an area of 10 cm^2 and the large piston has an area of 500 cm^2. What is the maximum load the large piston can lift when a force of 40 N is applied on the small piston?

A) 50 N **B)** 200 N **C)** 2000 N **D)** 20000 N

11. The velocity-time graph of a body moving along a straight line is shown. Find the average speed and the magnitude of the average velocity over the whole 10 s.



A) 5 m/s, 7 m/s **B)** 7 m/s, 5 m/s **C)** 7 m/s, 7 m/s **D)** 5 m/s, 5 m/s

12. A 0.5 kg ball strikes a wall perpendicularly at 12 m/s and rebounds along the same line at 8 m/s. The contact lasts 0.02 s. What is the magnitude of the average force exerted by the wall on the ball?

A) 100 N **B)** 200 N **C)** 500 N **D)** 300 N

13. A planet has 8 times the mass and 2 times the radius of the Earth. Taking g on Earth as 10 m/s^2, how long will a stone dropped from rest from a height of 40 m take to reach the ground on that planet?

A) 1.41 s **B)** 2 s **C)** 2.83 s **D)** 4 s

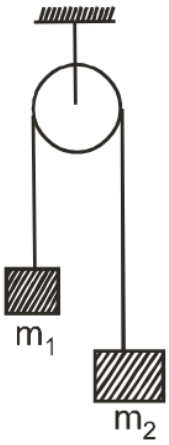
14. A wooden cube of side 10 cm and density 600 kg/m^3 floats in water (density 1000 kg/m^3). What is the maximum mass that can be placed on top of the cube so that the cube just becomes completely submerged?

A) 600 g **B)** 250 g **C)** 400 g **D)** 1000 g

15. A truck moving at a constant speed of 9 m/s passes a stationary car. Exactly 4 s after the truck passes, the car starts from rest with a uniform acceleration of 2 m/s^2 in the same direction. What is the speed of the car at the instant it overtakes the truck?

A) 24 m/s **B)** 18 m/s **C)** 32 m/s **D)** 12 m/s

16. Two masses m_1=5 kg and m_2 = 4.8 kg tied to a string are hanging over a light frictionless pulley. What is the acceleration of the masses when left free to move? (g = 9.8 m/s^2)



A) 5 m/s^2 **B)** 9.8 m/s^2 **C)** 0.2 m/s^2 **D)** 4.8 m/s^2

SECTION C — Chemistry

Questions 17–24 · 8 × 4 = 32 marks

17. Which of the following pairs consists of non-metals that are exceptions to the general rule that non-metals are dull?

A) Graphite and iodine **B)** Sulphur and phosphorus
C) Phosphorus and bromine **D)** Oxygen and nitrogen

18. Choose the correct statement about cheese.

A) It is an emulsion in which the dispersed phase is a liquid and the dispersion medium is a solid.
B) It is an emulsion in which the dispersed phase is a solid and the dispersion medium is a liquid.
C) It is a gel in which the dispersed phase is a liquid and the dispersion medium is a solid.
D) It is a gel in which the dispersed phase is a solid and the dispersion medium is a liquid.

19. Which of the following species has the same number of protons, electrons and neutrons?

A) $^{54}_{26}\mathrm{X}$ **B)** $^{54}_{27}\mathrm{X}$ **C)** $^{55}_{27}\mathrm{X}^{+}$ **D)** $^{55}_{28}\mathrm{X}^{+}$

20. An element is placed in period 3 and group 16 of the modern periodic table. The number of electrons in its outermost shell and its atomic number are respectively:

A) 6 electrons and atomic number 14 **B)** 6 electrons and atomic number 16
C) 4 electrons and atomic number 16 **D)** 8 electrons and atomic number 18

21. Which of the following observations cannot be explained by Dalton's atomic theory?

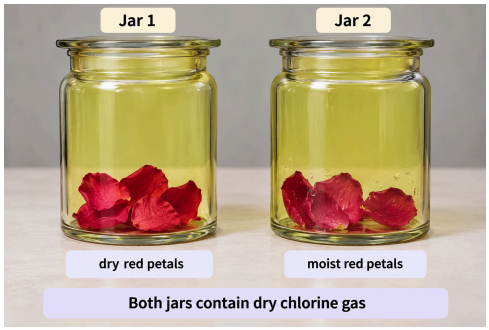
A) Chlorine atoms are found with masses of 35 u and 37 u.

B) Carbon forms two oxides, CO and CO_2, with oxygen masses in the ratio 1 : 2.

C) Mass is conserved when barium chloride reacts with sodium sulphate.

D) Water from all sources contains hydrogen and oxygen in the ratio 1 : 8 by mass.

22. Two gas jars containing dry chlorine are set up as shown. Jar 1 contains dry red flower petals and jar 2 contains moist red flower petals. What will be observed after some time?



A) Petals in both jars are bleached.

B) Only the petals in jar 1 are bleached.

C) Only the petals in jar 2 are bleached.

D) Petals in neither jar are bleached.

23. Which of the following statements is incorrect?

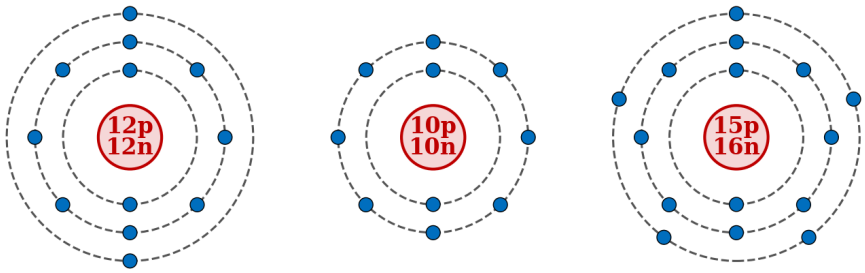
A) Na^+ ion is smaller than Na atom.

B) Cl^- ion is smaller than Cl atom.

C) F is the most electronegative element.

D) Fr is the largest atom.

24. The atomic structures of three elements X, Y and Z are shown below.



(1) Y has a completely filled outermost shell and exists as an unreactive, monoatomic gas.

(2) X attains stability by losing two electrons and forming X^{2+}.

(3) Z has five valence electrons and a valency of 3.

(4) The ion X^{2+} is isoelectronic with the ion Z^{3-}.

(5) Y is an isotope of X because both have the same number of protons and neutrons in the K and L shells.

Which of the statements are incorrect?

A) 1 and 2 only

B) 3 and 4 only

C) 2 and 5 only

D) 4 and 5 only

SECTION D — Biology

Questions 25–32 · 8 × 4 = 32 marks

25. Match the following.

Column I	Column II
A. Fungi	1. Cell wall made of chitin
B. Plantae	2. Cell wall made of cellulose
C. Monera	3. Prokaryotic organisation
D. Animalia	4. Holozoic nutrition

A) A-3, B-2, C-1, D-4 **B)** A-1, B-2, C-3, D-4 **C)** A-1, B-2, C-4, D-3 **D)** A-2, B-1, C-3, D-4

26. A plant cell is placed in a concentrated sucrose solution. After some time, the cell membrane pulls away from the cell wall. Which of the following best explains this observation?

A) Water enters the cell by osmosis, causing the vacuole to expand.

B) Sucrose enters the cell by diffusion, causing the cytoplasm to shrink.

C) Water moves out of the cell by osmosis, causing the protoplast to shrink.

D) Water and sucrose move equally in both directions, causing the cell to lose turgidity.

27. Consider the statements:

I. Cardiac muscle is striated and involuntary.
II. Smooth muscle is striated and involuntary.
III. Bone and cartilage are connective tissues.
IV. Neurons are the functional cells of nervous tissue.

Which statements are correct?

A) I, II and III only **B)** II, III and IV only **C)** I, II and IV only **D)** I, III and IV only

28. Which option correctly shows the stepwise digestion of a starch meal?

A) Starch → amino acids (by trypsin) → glucose

B) Starch → maltose (by amylase) → glucose (by maltase)

C) Starch → fatty acids (by lipase) → glucose

D) Starch → glucose (by amylase) → maltose (by maltase)

29. **Assertion (A):** The Urey–Miller experiment supports the theory of chemical evolution of life.

Reason (R): Amino acids were formed from simple inorganic molecules under conditions simulating the early Earth.

A) Both Assertion (A) and Reason (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

30. In a healthy adult, about 180 litres of glomerular filtrate is formed per day and about 1.5 litres of urine is excreted. Approximately what percentage of the filtrate is reabsorbed?

A) 99.2% **B)** 99.9% **C)** 98.5% **D)** 90%

31. Which path correctly shows how a glucose molecule absorbed in the small intestine reaches the right atrium?

A) Intestinal capillaries → hepatic portal vein → liver → pulmonary vein → left atrium

B) Intestinal capillaries → hepatic vein → liver → hepatic portal vein → inferior vena cava → right atrium

C) Intestinal capillaries → hepatic portal vein → liver → hepatic vein → inferior vena cava → right atrium

D) Intestinal capillaries → superior vena cava → right atrium

32. During inspiration

A) the diaphragm contracts and domes, and the ribs move downwards and inwards

B) the diaphragm relaxes and domes, and the ribs move downwards and inwards

C) the diaphragm relaxes and flattens, and the ribs move upwards and outwards

D) the diaphragm contracts and flattens, and the ribs move upwards and outwards

SECTION E — Mathematics

Questions 33–40 · 8 × 4 = 32 marks

33. Which of the following is an irrational number?

A) $\frac{22}{7}$ **B)** $3.\overline{14}$

C) 0.101001000100001... **D)** $\sqrt{0.09}$

34. When the polynomial $p(x) = x^3 - 3x^2 + kx - 5$ is divided by $(x - 2)$, the remainder is 3. What is the remainder when $p(x)$ is divided by $(x + 1)$?

A) −15 **B)** −1 **C)** −3 **D)** 3

35. A point P lies on the x-axis and is equidistant from the points A(2, −5) and B(−2, 9). What are the coordinates of P?

A) (7, 0) **B)** (0, 2) **C)** (0, −7) **D)** (−7, 0)

36. The taxi fare in a city is ₹ 25 for the first kilometre and ₹ 14 for every subsequent kilometre. If the distance travelled is x km ($x \geq 1$) and the total fare is ₹ y, which linear equation represents this situation?

A) $y = 14x + 25$ **B)** $y = 14x + 11$ **C)** $y = 25x + 14$ **D)** $y = 14x - 11$

37. In $\triangle ABC$, $\angle B = 74°$ and $\angle C = 38°$. AD is the bisector of $\angle A$ and AE is perpendicular to BC, where D and E lie on BC. What is the measure of $\angle DAE$?

A) 34° **B)** 16° **C)** 36° **D)** 18°

38. Each interior angle of a regular polygon is 140°. How many diagonals does the polygon have?

A) 27 **B)** 36 **C)** 54 **D)** 18

39. A, B and C are three points on a circle of radius 5 cm such that AB = AC = 6 cm. What is the length of the chord BC?

A) 4.8 cm **B)** 8 cm **C)** 9.6 cm **D)** 10 cm

40. A shopkeeper marks his goods 40% above the cost price and allows a discount of 10% on the marked price. While selling, he also uses a false weight of 960 g in place of 1 kg. What is his overall profit percentage?

A) 26% **B)** 31.25% **C)** 40% **D)** 31.04%

END OF QUESTION PAPER