NSMC 2026 · QUESTION PAPER

National Science and Math Championship

Where Curiosity meets Competition

Conducted by XandY Learning

GRADE 08

GRADE	TOTAL QUESTIONS	MAXIMUM MARKS	MARKING SCHEME
08	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 CAB is coded as 9-1-4, how is DOG coded?

A) 16-225-49 **B)** 16-196-49 **C)** 8-30-14 **D)** 16-225-36

2. How many of the 26 capital letters look the same in a mirror?

A) 9 **B)** 10 **C)** 11 **D)** 12

3. Pathology : Disease :: Seismology : ?

A) Volcanoes **B)** Weather **C)** Rocks **D)** Earthquakes

4. If × means ÷ and ÷ means ×, then 12 × 4 ÷ 3 = ?

A) 9 **B)** 16 **C)** 1 **D)** 144

5. Find the odd one out.

A) Periyar **B)** Bharathapuzha **C)** Pamba **D)** Vembanad

6. 3, 8, 18, 35, 61, 98, ___

A) 142 **B)** 145 **C)** 148 **D)** 150

7. Pointing to a woman, Arjun said, "She is the wife of the only son of my mother's father." How is the woman related to Arjun?

A) Mother **B)** Sister **C)** Maternal aunt **D)** Paternal aunt

8. The letters of the word EXAMINATION are arranged alphabetically. If all vowels are then moved to the end while keeping their relative alphabetical order, which letter will be 7th from the left?

A) A **B)** E **C)** I **D)** N

9. A rectangular water tank measures 2 m × 50 cm × 40 cm. How many litres of water can it hold when it is completely full? (1 L = 1000 cm^3)

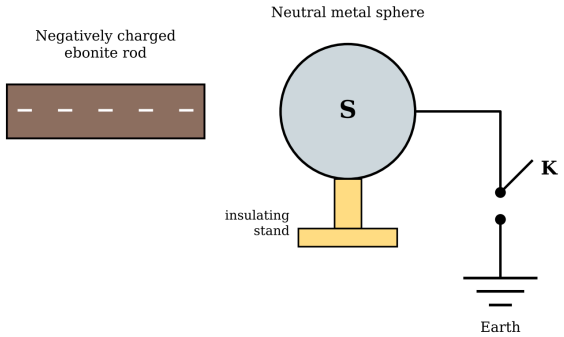
A) 4 L **B)** 40 L **C)** 400 L **D)** 4000 L

10. Steel bar AB is magnetised by single stroke with the north pole of a magnet, stroking from A to B. Steel bar CD is magnetised by double stroke, with the north pole moving towards C and the south pole towards D. What are the poles at B and D, and what happens when A is brought near C?

A) B is north, D is north; A and C repel **B)** B is south, D is south; A and C repel

C) B is north, D is south; A and C attract **D)** B is south, D is north; A and C attract

11. A neutral metal sphere S stands on an insulating stand. It is connected to the earth through a switch K, which is open. A negatively charged ebonite rod is brought near S without touching it. While the rod is held there, K is closed for a moment and then opened again. Finally the rod is taken far away. Read the statements:

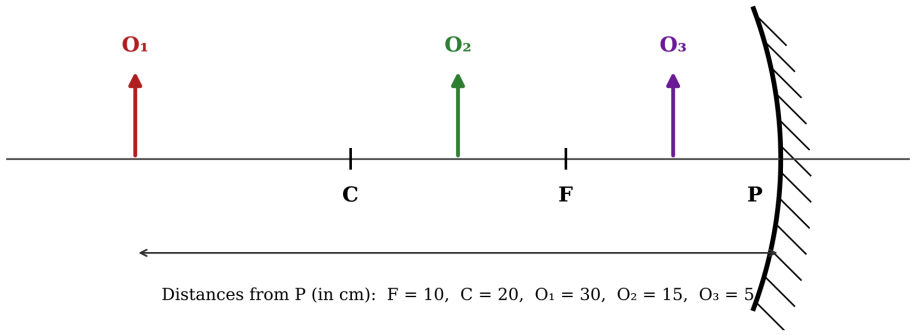


I. When K is closed, electrons flow from S to the earth.
II. After the rod is removed, S carries a positive charge.
III. If the rod had been taken away before K was opened (K still closed), S would end up positively charged.
IV. The charge on the rod is unchanged at the end of the whole process.

Which statements are correct?

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

12. A concave mirror has its pole P, focus F and centre of curvature C marked as shown. A small object is placed at O_1, O_2 and O_3 in three separate trials. Read the following statements:



I. At O_1 the image is real, inverted and magnified, and lies between F and C.
II. At O_2 the image is real, inverted and magnified, and lies beyond C.
III. At O_3 the image is virtual, erect and magnified, and lies behind the mirror.
IV. When the object is moved from O_1 to O_2, the image moves away from the mirror and becomes larger.

Which statements are correct?

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

13. Read the following statements about heat and temperature:

I. A body at 98 °F is at a higher temperature than a body at 39.2 °C.
II. At the seashore, a sea breeze blows towards the land in the afternoon because the land warms up faster than the sea.
III. In conduction through a solid rod, the heated particles travel from the hot end to the cold end carrying the heat with them.
IV. During a change of state, a substance can absorb or release heat without any change in its temperature.

Which statements are correct?

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

14. A brick weighing 24 N has dimensions 20 cm × 10 cm × 5 cm. It is placed on a table, resting on a different face each time. What is the difference between the greatest and the least pressure it exerts on the table?

A) 3600 Pa **B)** 1200 Pa **C)** 4800 Pa **D)** 2400 Pa

15. A car starts with a velocity of 8 m/s and accelerates uniformly at 3 m/s^2 for 6 s. It then continues to accelerate uniformly at 1.5 m/s^2 for the next 8 s. Find the final velocity of the car after 14 s using the first equation of motion.

A) 12 m/s **B)** 28 m/s **C)** 38 m/s **D)** 42 m/s

16. A solid object of mass 100 kg is completely immersed in water. Its apparent weight becomes 60% of its actual weight. The same object is then immersed completely in another liquid, where its apparent weight becomes 40% of its actual weight. If (g = 10 m/s^2), what is the weight of water displaced and the density of the second liquid relative to water?

A) 400 N and 1.2 **B)** 600 N and 1.5 **C)** 400 N and 1.5 **D)** 600 N and 1.2

SECTION C — Chemistry

Questions 17–24 · 8 × 4 = 32 marks

17. Find the odd one out based on the type of plastic.

A) Teflon **B)** Bakelite **C)** Melamine **D)** Epoxy resin

18. Which statements are correct?

(i) The temperature stays constant during melting because heat is used to overcome the forces between particles.
(ii) Increasing the pressure raises the boiling point of water.
(iii) Evaporation takes place only at the boiling point.
(iv) Dry ice changes directly from solid to gas at normal pressure.

A) (i) and (iii) only **B)** (ii), (iii) and (iv) only
C) All four **D)** (i), (ii) and (iv) only

19. In which set do all the symbols come from Latin names?

A) Na, Ca, Hg **B)** Sn, Pb, Fe **C)** Cu, Zn, Al **D)** Ag, Cl, Au

20. Which of the following is a correct example of an emulsion and an aerosol, respectively?

A) Milk and fog **B)** Smoke and butter
C) Fog and milk **D)** Jelly and smoke

21. Which statements are correct?

(i) Water is densest at 4 °C.
(ii) Ice floats on water because ice is denser than water.
(iii) Water is called the universal solvent because it dissolves many substances.
(iv) Hard water forms scum with soap.

A) (i), (ii) and (iii) only **B)** (i), (iii) and (iv) only
C) (iii) and (iv) only **D)** All four

22. Arjun dipped a paper strip in solution X and dried it. He put a few drops of solution Y on it, in which the number of H^+ ions is more than that of OH^- ions. The paper turned dark pink (magenta). Solutions X and Y could be respectively:

A) Turmeric solution and vinegar **B)** China rose solution and lemon juice
C) Phenolphthalein and lime water **D)** Methyl orange and soap solution

23. Four reactions are carried out:

P - quicklime + water
Q - ammonium chloride + barium hydroxide
R - potassium permanganate + glycerine
S - potassium permanganate being heated.

Which two reactions absorb heat?

A) P and R **B)** Q and S **C)** P and S **D)** Q and R

24. Four metals P, Q, R and S show the following properties:

- P reacts with hot water but not with cold water.
- Q is more reactive than R but less reactive than P.
- R reacts with dilute HCl and releases hydrogen gas, but S does not.

Which of the following represents the increasing order of reactivity?

A) P < Q < R < S **B)** S < R < Q < P **C)** R < S < Q < P **D)** S < Q < R < P

SECTION D — Biology

Questions 25–32 · 8 × 4 = 32 marks

25. A cell has completed DNA replication but has not yet entered mitosis. According to the cell cycle, it is in which phase?

A) G1 phase **B)** S phase **C)** G2 phase **D)** M phase

26. Consider the statements:

I. Areolar tissue is a loose connective tissue.
II. Tendons connect muscles to bones.
III. Ligaments connect muscles to muscles.
IV. Adipose tissue stores fat.

Which statements are correct?

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

27. Which sequence correctly shows the main steps of the nitrogen cycle?

A) Nitrification → nitrogen fixation → assimilation by plants → denitrification → ammonification
B) Nitrogen fixation → denitrification → nitrification → assimilation by plants → ammonification
C) Assimilation by plants → nitrogen fixation → nitrification → denitrification → ammonification
D) Nitrogen fixation → nitrification → assimilation by plants → ammonification → denitrification

28. In the food chain Grass → Grasshopper → Frog → Snake → Hawk, the grass has 560000 J of energy. By the 10% law, how much energy is available to the hawk?

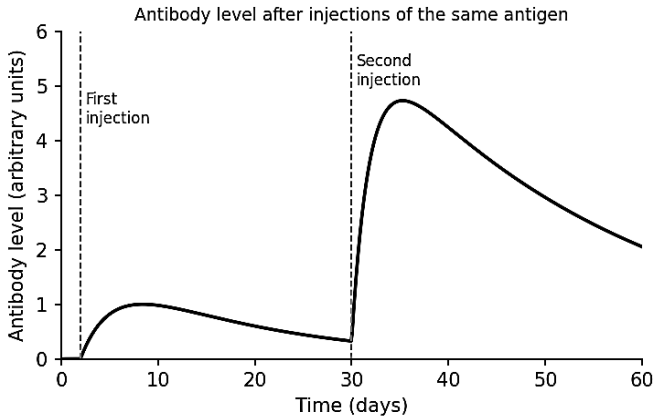
A) 5.6 J **B)** 56 J **C)** 5600 J **D)** 560 J

29. Match the following.

Column I	Column II
A. Malaria	1. Protozoan
B. Tuberculosis	2. Bacterium
C. Dengue	3. Virus
D. Ringworm	4. Fungus

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

30. The graph shows antibody levels after two injections of the same antigen given 28 days apart. Which conclusion is correct?



A) The second response is faster because antibodies from first injection are used up

B) The second response is slower because antibodies are not used up

C) The second response is faster and stronger because of memory cells

D) The body makes antibodies only after the second injection

31. **Assertion (A):** Prokaryotic cells lack membrane-bound organelles.

Reason (R): The DNA of a prokaryotic cell is not enclosed by a nuclear membrane.

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

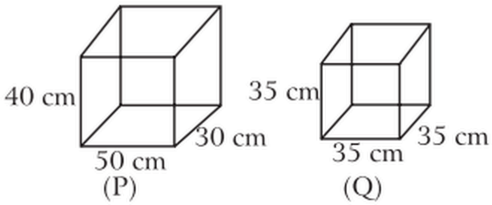
D) A is false, but R is true

32. Match the following.

Column I	Column II
A. Urea	1. Nitrogen and phosphorus fertilizer
B. Compost	2. Biopesticide
C. Diammonium phosphate	3. Organic manure
D. Neem extract	4. Nitrogen fertilizer

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

33. Given below are two closed boxes with their dimensions. Which box will require less material to make?



A) Box P
B) Box Q
C) Both boxes require the same amount of material
D) Cannot be determined

34. Udai invested Rs 60,000 in a finance company. He received Rs 68,694 after 2 years. If the interest was compounded annually, at what rate of interest per annum did he invest his money?

A) 6% **B)** 7% **C)** 8% **D)** 9%

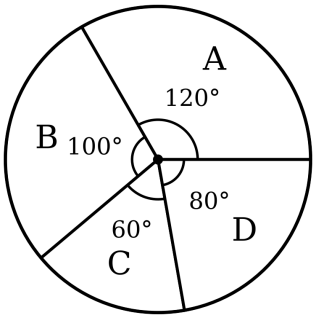
35. A steamer goes downstream and covers the distance between two ports in 6 hours, while it covers the same distance upstream in 8 hours. If the speed of the stream is 2 km/h, what is the average speed of the steamer for the whole journey (downstream and back upstream)?

A) $12\frac{6}{7}$ km/h **B)** $13\frac{3}{7}$ km/h **C)** $13\frac{5}{7}$ km/h **D)** 14 km/h

36. Express 125^{-4} as a power with base 5.

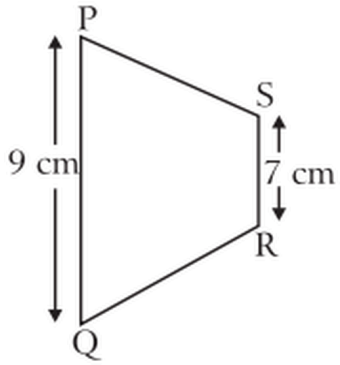
A) 5^{12} **B)** 12^{-5} **C)** 12^{5} **D)** 5^{-12}

37. In the given figure, what percent of the circle is occupied by sector C?



A) $16\frac{2}{3}\%$ **B)** $22\frac{2}{9}\%$ **C)** $27\frac{7}{9}\%$ **D)** $33\frac{1}{3}\%$

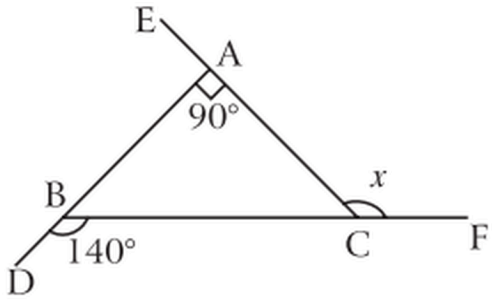
38. PQRS is a trapezium in which PQ ∥ SR, as shown in the figure. Its area is 24 sq. cm. Find the distance between PQ and SR.



(Figure not to scale)

A) 4 cm **B)** 6 cm **C)** 2 cm **D)** 3 cm

39. In the adjoining figure, DBA and BCF are straight lines. Find the value of *x*.



A) 40° **B)** 50° **C)** 130° **D)** 140°

40. If $\frac{x+2}{x-2} + \frac{x+3}{x-3} = 2$, find the value of *x*.

A) $\frac{12}{5}$ **B)** $\frac{13}{5}$ **C)** $\frac{14}{5}$ **D)** $\frac{16}{5}$

END OF QUESTION PAPER