

Diagnostic cum Scholarship Tests

SAMPLE PAPER

For Students of Class IX

Paper 2

NTSE Science & Mathematics

Duration : 60 minutes

Paper Code: 89-2

Maximum Marks : 60

Please read the instructions and guidelines carefully :

Important Note : Please ensure to accurately input the details for the Question Paper Code as indicated at the top of this sheet (Side 2) into the corresponding columns / fields on the OMR sheet before proceeding with the paper. Incorrectly filled information regarding the class or paper may result in inaccurate outcomes or results.

"This paper has been scientifically designed to evaluate your potential – manifested and hidden for the target examinations mentioned in various sections of the paper. Thus, your adherence to the instructions is critical in the evaluation of the same"

1. This Question paper consists of 2 sections.
2. Student should devote allotted time for each section. If a section is easy, then it is easy for everyone & was meant to be like that with a goal in mind. Do not switch over to another section if you find the section to be easy. If a section is tough, then it is tough for everyone. You are advised to spend 30 Minutes on Section-I and 30 Minutes on Section-II. Dedicating the required time to finish each section successfully is essential. Opening the next section before completing the allotted time for the preceding section is not permitted. This adherence is crucial for assessing your true potential, as each section is meticulously crafted to evaluate your potential for the corresponding competitive examinations.
3. Candidate should open the seal of Section-II only after devoting 30 minutes on Section-I.
4. Sheets will be given to each candidate for rough work. Candidate must fill all details on the rough sheet and submit the same to invigilator along with OMR sheet. Candidate must mention the Question No. while doing the rough work in the sheet.
5. Please note candidates are not allowed to bring any prohibited items into the exam hall such as electronic devices, mobile phones, smart watch, earphones, calculators, books, notes, formula sheets, and bags.
6. Marking scheme is given in table below:

Section	Subject	Question no.	Marking Scheme for each question	
			Correct answer	Wrong answer
SECTION – I (NTSE-Science) Time Allotted: 30 Minutes	PHYSICS (Part-A)	1 to 10	+1	0
	CHEMISTRY (Part-B)	11 to 20	+1	0
	BIOLOGY (Part-C)	21 to 30	+1	0
SECTION – II (NTSE-Mathematics) Time Allotted: 30 Minutes	MATHEMATICS (Part-A)	31 to 60	+1	0

Section - I

Time: 30 Minutes

PHYSICS - (PART - A)

This part contains 10 Multiple Choice Questions number 1 to 10. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

- An object oscillates 10 times in 20 seconds. Its frequency of oscillation is
(A) 2 Hz (B) 1 Hz
(C) 200 Hz (D) 0.5 Hz
- You push a box with a horizontal force of 50 newton (N). At the same time, your friend pushes it with a force of 80 newton (N) in opposite direction to your push. The object experiences a resultant force of
(A) 30 N towards your friend (B) 30 N towards you
(C) 130 N towards your friend (D) 130 N towards you
- A block of wood of dimensions 40 cm x 20 cm x 10 cm is kept on a tabletop. As pressure is a measure of force per unit area, the pressure exerted by the wooden block on the tabletop depends on how the block is placed on the table i.e., which side lies on the surface of the table. Match the **Column-I** with **Column-II**.


Column - I		Column -II	
(a)	Block is placed with its 10 cm x 20 cm side on the surface of the table	(p)	Zero pressure
(b)	Block is placed with its 20 cm x 40 cm side on the surface of the table	(q)	Minimum (non-zero) pressure
(c)	Block is placed with its 10 cm x 40 cm side on the surface of the table	(r)	Maximum pressure
(d)	Block is placed with its 10 cm x 40 cm on the surface of the table in a gravity free space	(s)	Pressure neither maximum or minimum (non-zero)

- (A) (a - r), (b - q), (c - p), (d - s) (B) (a - q), (b - r), (c - p), (d - s)
(C) (a - q), (b - r), (c - s), (d - p) (D) (a - r), (b - q), (c - s), (d - p)
- Statement-I:** A pendulum completes 54 oscillations in one minute. The frequency of the pendulum is 54 Hertz.

Statement-II: When the frequency of vibration is high, the sound produced is loud.

Statement-III: Sound can travel through solids, liquids and gases

(A) Only statement-III above is correct.
(B) All the statements I, II and III above are correct.
(C) Only statements I and II above are correct
(D) Only statements I and III above are correct.
 - The device used to detect electric charge
(A) Telescope (B) Stethoscope
(C) Electroscope (D) Microscope

6. If a positive charge 'A' is kept as shown, it will _____ charge 'B' (charge B is negative)
- (A) Attract
(B) Repel
(C) First attract then repel
(D) None of these
- 
7. Inertia is the property of a body by virtue of which the body is
- (A) Unable to change its density
(B) Unable to change its colour
(C) Unable to change its gravity
(D) Unable to change by itself the state of rest and of uniform linear motion
8. Identify the wrong statement. The momentum of a body is
- (A) The product of mass and velocity of the body
(B) The product of force and time
(C) The product of force and velocity
(D) Measured in kg m/s in S.I. system
9. To obtain a parallel reflected beam from a torch, the reflector of the torch should be
- (A) convex
(B) plane
(C) concave
(D) more of these
10. When light passes from one medium into another medium, then the physical property which does not change is
- (A) velocity
(B) wavelength
(C) frequency
(D) refractive index

CHEMISTRY – (PART – B)

This part contains 10 Multiple Choice Questions number 11 to 20. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

11. Identify the gas that is generally produced when coal is burnt in the presence of a lot of air.
- (A) Carbon monoxide
(B) Sulphur dioxide
(C) Nitrogen dioxide
(D) Carbon dioxide
12. Which of the following is also known as the 'black gold'?
- (A) CNG
(B) Natural gas
(C) Coal
(D) Petroleum
13. When zinc reacts with dilute sulphuric acid, a salt is formed with the release of a gas. The gas produced during this puts off a burning candle with a pop sound. The gas evolved during this reaction is:
- (A) Sulphur dioxide
(B) Oxygen
(C) Hydrogen
(D) Hydrogen sulphide

19. Now a days only compounds A and B are used for matchstick head. A and B are
(A) White phosphorus and coal powder (B) Antimony trisulphide and powdered glass
(C) Potassium chlorate and powdered glass (D) Antimony trisulphide and potassium chlorate
20. An amalgam of metal has which other element?
(A) C (B) Ag
(C) Mg (D) Hg

BIOLOGY - (PART - C)

This part contains 10 Multiple Choice Questions number 21 to 30. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

21. Malaria is a mosquito-borne infectious disease caused by.
(A) Prokaryotic Parasite (B) Eukaryotic parasite
(C) Fungi (D) Virus
22. Find disadvantage of using manure, from the followings.
(A) It enhances the water holding capacity of the soil.
(B) Improve the texture of the soil.
(C) Increases the number of friendly microbes.
(D) Inconvenient to handle, store and transport
23. Find the incorrect match from the followings.
(A) Bharatpur bird sanctuary - Rajasthan
(B) Lockchao wild life sanctuary - Manipur
(C) Pachmarhi Biodphere Reserve - Tamilnadu
(D) Great Nicobar Biosphere Reserve – Andaman and Nicobar
24. In nitrogen cycle, conversion of atmospheric nitrogen into ammonia is done by.
(A) Nitrosomonas (B) Rhizobium
(C) Pseudomonas (D) Azatobactor
25. An ecosystem includes;
1. Plants 2. Animals
3. Soil 4. Microorganism
5. Climate
Choose correct options
(A) Both 1 and 2 only (B) 1, 2, 3 and 4 only
(C) 1, 2, 3, 4 and 5 (D) 1, 2 and 3 only
26. The thread like structures present in the nucleus are
(A) Nucleolus (B) Ribosomes
(C) Chromosomes (D) ER
27. Which of the following is not a cell?
(A) RBCs (B) WBCs
(C) Bacteria (D) Virus
28. Deforestation increases the level of _____ in atmosphere.
(A) Nitrogen (B) CO₂
(C) O₂ (D) Chlorine

29. Who discovered the vaccine for small pox?
 (A) Alexander Flemming (B) Robert Hook
 (C) Edward Jenner (D) Charles Darwin
30. The conversion of fertile land into deserts is
 (A) Deforestation (B) Desertification
 (C) Defertilisation (D) Desterilisation

Section – II

Time: 30 Minutes

MATHEMATICS – (PART – A)

This part contains 30 Multiple Choice Questions number 31 to 60. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

31. If $pqr = 1$, the value of the expression $\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$ is equal to
 (A) $p + q + r^{-1}$ (B) $\frac{1}{p+q+r}$
 (C) $p + q + r$ (D) $p^{-1} + q^{-1} + r^{-1}$
32. 12 litres are drawn out from 35 litres of a 5 : 7 milk and water solution. What is the ratio of milk and water in the remaining solution?
 (A) 7 : 5 (B) 25 : 12
 (C) 12 : 25 (D) 5 : 7
33. What is the value of $\frac{0.\overline{679} - 0.\overline{072}}{0.\overline{432} + 0.\overline{35}}$?
 (A) $\frac{6672}{8659}$ (B) $\frac{6677}{8658}$
 (C) $\frac{6675}{8629}$ (D) $\frac{6692}{8658}$
34. If $x = 17^4$ and $y = 14 \times 16 \times 18 \times 20$, then _____
 (A) $x > y$ (B) $x < y$
 (C) $x = y$ (D) None of these
35. Find the value of N.

$$N = \left(\frac{2 \times 8 + 8 \times 32 + 18 \times 72 \dots \text{up to } n \text{ terms}}{1 + 16 + 81 + \dots \text{up to } n \text{ terms}} \right)^{\frac{1}{4}}$$
 (A) $2n$ (B) 2^n
 (C) 2 (D) None of these

36. Find the value of $\sqrt{\frac{(12.12)^2 - (8.12)^2}{(0.25)^2 + (0.25)(19.99)}} + \frac{\left(8^{-\frac{3}{4}}\right)^{\frac{8}{15}} \times 16^{\frac{3}{4}}}{\sqrt[3]{\left[\left((128)^{-5}\right)^{\frac{3}{7}}\right]^{\frac{-1}{5}}}}$

You have to take positive square roots only.

- (A) 0 (B) 1
(C) $\frac{9}{2}$ (D) None of these

37. What is the value of $\frac{\left(1 + \frac{1}{3}\right)^4 + \left(1 + \frac{1}{3}\right)^{-4} + 1}{\left(1 + \frac{1}{3}\right)^2 + \left(1 + \frac{1}{3}\right)^{-2} + 1}$?

- (A) $\frac{193}{144}$ (B) $\frac{293}{144}$
(C) $\frac{191}{144}$ (D) $\frac{291}{144}$

38. $N = (11111111)^2$. What is the sum of the digits of N?

- (A) 72 (B) 62
(C) 64 (D) None of these

39. Which of the following is true?

- (A) $7^{3^2} = (7^3)^2$ (B) $7^{3^2} > (7^3)^2$
(C) $7^{3^2} < (7^3)^2$ (D) None of these

40. n^3 is odd. Which of the following statement (s) is (are) true?

- I. n is odd.
II. n^2 is odd.
III. n^2 is even
(A) I only (B) II only
(C) I and II (D) I and III

41. The interior angle of the regular polygon exceeds the exterior angle by 132° . The number of sides in the polygon will be

- (A) 10 (B) 16
(C) 12 (D) 15

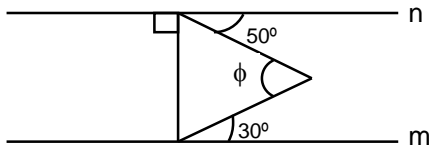
42. The angles of a quadrilateral are in ratio 1:2:3:4. Which angle has the largest measure?

- (A) 120° (B) 144°
(C) 98° (D) 36°

43. In a parallelogram ABCD, angle A and angle B are in the ratio 1:2. Find the angle A.

- (A) 30° (B) 45°
(C) 60° (D) 90°

44. If the two lines n and m are parallel, then find the value of ϕ in the given figure.



- (A) 40° (B) 50°
 (C) 80° (D) 130°
45. The length of a diagonal of a rhombus is $\frac{4}{5}$ th of the length of the other diagonal. What is the ratio of the area of the rhombus to the square of its larger diagonal?
 (A) $0.8 : 1$ (B) $0.6 : 1$
 (C) $0.4 : 3$ (D) $0.4 : 1$
46. If $a^2\%$ of b is equal to $b^3\%$ of c , and $c^4\%$ of a is equal to $b\%$ of b , then the relation between a and b is given by
 (A) $a = b$ (B) $a = b^2$
 (C) $a^9 = b^{10}$ (D) $a = b^{10}$
47. The list price of an article was increased by 10%, and then decreased by 10%. If the final price become Rs. 20, then find the initial list price (in Rs.).
 (A) $\frac{10 \times 100^2}{100^2 - 20^2}$ (B) $\frac{20^2 \times 10^2}{100^2 - 10^2}$
 (C) $\frac{20 \times 100}{100^2 - 10^2}$ (D) $20 \times \left(\frac{100^2 - 10^2}{100^2} \right)$
48. If $3x + \frac{y}{5} = 10$ and $xy = 5$ then find $27x^3 + \frac{y^3}{125}$
 (A) 1090 (B) 910
 (C) 1001 (D) 9009
49. If $a + \frac{1}{b} = 1$; $b + \frac{1}{c} = 1$ then $c + \frac{1}{a} = ?$
 (A) 1 (B) 2
 (C) 0 (D) -1
50. If $ab + bc + ca = 4$ and $abc = 2$, then find the value of $\frac{1}{a} + \frac{1}{b} + \frac{1}{c}$
 (A) 2 (B) 1
 (C) 0 (D) -1
51. $\left((12^2 - 4^4) \times 2 \right)^{\frac{3}{4}} = ?$
 (A) 16 (B) 8
 (C) 64 (D) 32
52. The value of x for which $(256)^{\left(x - \frac{3}{2}\right)} = 2^{-20}$ is
 (A) 4 (B) 3
 (C) 2 (D) 1

53. If $(x^y)^z = x^{yz}$, where each of x , y and z is greater than 1, then y is
 (A) z^{z-1} (B) $z^{\frac{1}{z+1}}$
 (C) $z^{\frac{1}{z-1}}$ (D) z^{z+1}
54. A certain sum is deposited for 4 years at a rate of 10% per annum on compound interest compounded annually. The difference between the interest at the end of 2 years and that at the end of 4 years is Rs. 5,082. Find the sum (in Rs.).
 (A) 20,000 (B) 25,500
 (C) 50,820 (D) 10,164
55. Shehal can row 28 km downstream and 12 km upstream in 5 hours. He can row 21 km downstream and 10 km upstream in 4 hours. Find the speed of Shehal in still water.
 (A) 9 kmph (B) 8 kmph
 (C) 6 kmph (D) 9 kmph
56. If $a - \frac{1}{a-5} = 10$, then the value of $(a-5)^3 - \frac{1}{(a-5)^3}$ is :
 (A) 140 (B) 70
 (C) 100 (D) 120
57. What number must be added to each of the numbers 6, 15, 20, 43 to make four numbers proportional?
 (A) 1 (B) 2
 (C) 3 (D) 4
58. A three-digit number $4a2$ is added to the number 276 to get a three-digit number $6b8$. Find the value of $b - a$.
 (A) 7 (B) 2
 (C) 3 (D) 4
59. If $a + b + c = 6$ and $a^2 + b^2 + c^2 = 26$, then find the value of $ab + bc + ca$.
 (A) 2 (B) 5
 (C) 3 (D) 4
60. If the numbers $\sqrt[3]{9}$, $\sqrt[4]{20}$, $\sqrt[6]{25}$ are arranged in ascending order, then the right arrangement is
 (A) $\sqrt[3]{9} < \sqrt[4]{20} < \sqrt[6]{25}$ (B) $\sqrt[6]{25} < \sqrt[4]{20} < \sqrt[3]{9}$
 (C) $\sqrt[6]{25} < \sqrt[3]{9} < \sqrt[4]{20}$ (D) $\sqrt[4]{20} < \sqrt[6]{25} < \sqrt[3]{9}$

FIITJEE

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SAMPLE PAPER

For Students of Class IX

Paper 2

NTSE Science & Mathematics

Paper Code: 89-2

ANSWER KEY

1.	D	2.	B	3.	D	4.	A
5.	C	6.	A	7.	D	8.	C
9.	C	10.	C	11.	D	12.	D
13.	C	14.	B	15.	D	16.	B
17.	C	18.	A	19.	D	20.	D
21.	B	22.	D	23.	C	24.	B
25.	C	26.	C	27.	D	28.	B
29.	C	30.	B	31.	C	32.	D
33.	B	34.	A	35.	C	36.	C
37.	A	38.	C	39.	B	40.	C
41.	D	42.	B	43.	C	44.	C
45.	D	46.	C	47.	C	48.	B
49.	A	50.	A	51.	C	52.	A
53.	C	54.	A	55.	D	56.	A
57.	C	58.	A	59.	B	60.	C