BIG BANG
EDGE TEST

SAMPLE PAPER

For Students presently in Class IX

Paper 1
(Paper-1a+1b)

NTSE – MENTAL ABILITY, SCIENCE & MATHEMATICS and JEE Main

Duration : 100 minutes

Paper Code: 910-1

Maximum Marks : 140

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 4 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 20 Minutes on Section-I, 30 Minutes on Section-II, 20 Minutes on Section-III and 30 Minutes on Section-IV. 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 20 minutes on Section-I, seal for Section-III is to be opened only after devoting 30 minutes on Section-II & seal for Section-IV to be opened only after devoting 20 minutes on Section-III.
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
PAPER – 1a (Section – I) (NTSE) Time Allotted: 20 Minutes	MENTAL ABILITY	1 to 10	+3	–1
PAPER – 1a (Section – II) (NTSE – SCIENCE) Time Allotted: 30 Minutes	PHYSICS (PART-A)	11 to 20	+1	0
	CHEMISTRY (PART-B)	21 to 30	+1	0
	BIOLOGY (PART-C)	31 to 40	+1	0
PAPER – 1a (Section – III) (NTSE – MATHEMATICS) Time Allotted: 20 Minutes	MATHEMATICS (PART-A)	41 to 60	+1	0
PAPER – 1b (Section – IV) (JEE Main) Time Allotted: 30 Minutes	PHYSICS (PART-A)	61 to 62	+4	–1
	CHEMISTRY (PART-B)	63 to 64	+4	–1
	MATHEMATICS (PART-C)	65 to 66	+4	–1
	PHYSICS (PART-D)	67 to 69	+4	–1
	CHEMISTRY (PART-E)	70 to 72	+4	–1
	MATHEMATICS (PART-F)	73 to 75	+4	–1

Paper-1a (Section – I)

Time: 20 Minutes

MENTAL ABILITY

*This section 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.*

1. My dog Bunny, runs 30 m towards west, turns left and runs 10 m, then turns right, and runs 5 m, then turns left and runs 2 m and again turns right, runs 12 m. Finally it turns left and runs 7 m. In which direction is it running now?
   (A) East (B) West
   (C) North (D) South

2. In a certain code language, DISABLE is written as HRL20. How is ENABLE written in that code?
   (A) GA 21 (B) HR 20
   (C) JB 20 (D) ID 20

3. If East become North – West, North – West become South, and so on, then what will South become?
   (A) North - West (B) South – West
   (C) West (D) North – East

4. N ranks fifth in the class. S is eight from the last. If T is sixth after N and just in the middle of N and S, then how many students are there in the class?
   (A) 23 (B) 24
   (C) 25 (D) 26

5. In a certain code language, 'UNIVERSITY' is written as 'VNJVFRTIUY'. Following the same code language, how would you write 'SECRETARY'?
   (A) TFDRFTBRZ (B) TFERFTBRY
   (C) SFCSEUASY (D) TEDRFTBRZ

6. A 'room' is called 'bed', 'bed' is called 'window', 'window' is called 'flower' and 'flower' is called 'cooler', on what would a man sleep?
   (A) Cooler (B) Flower
   (C) Window (D) Bed

7. Find the next term in the series:
   1, 26, 62, 111, 175 _____
   (A) 250 (B) 242
   (C) 238 (D) 256

8. A man goes to a park and sees a girl who he recognised to be his relative. The girl was the daughter of his sister's husband's wife. How is the girl related to the man?
   (A) sister (B) niece
   (C) wife (D) sister in law

9. A student went to a class at quarter to ten. After 15 minutes his professor came who is late to the class by 25 minutes. At what time should the class start?
   (A) 9:25 (B) 9:35
   (C) 9:40 (D) 9:45

10. In the following problem, a square transparent sheet with a pattern is given. Figure out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.

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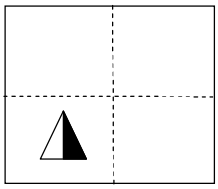
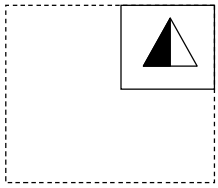


(X)

(A)



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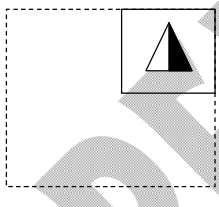

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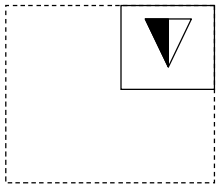

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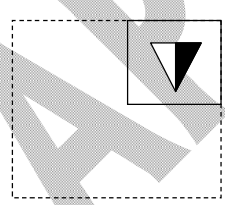


Paper-1a (Section – II)

Time: 30 Minutes

PHYSICS (PART – A)

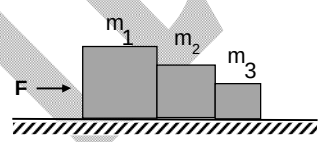
*This part contains **10 Multiple Choice Questions** number **11 to 20.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

11. Name the physical quantity that is defined as the rate of change of displacement.
(A) Velocity (B) Acceleration
(C) Distance (D) Speed

12. Newton's law of Gravitation is valid
(A) On the earth only (B) In the laboratory only
(C) On the moon only (D) Everywhere

13. A bomb of mass 9 kg explodes into two pieces of masses 3 kg and 6 kg. The velocity of 3 kg mass is 16 m/s. The velocity of 6 kg mass is
(A) 4 m/s (B) 8 m/s
(C) 16 m/s (D) 32 m/s

14. Three blocks of masses $m_1 = 3m, m_2 = 2m$ and $m_3 = m$ are placed in contact on a horizontal frictionless surface as shown in the figure below. A horizontal forces F is applied to mass m_1 as shown. Then match the items in Column - I with Column - II.



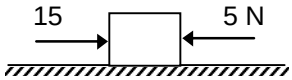
Column - I		Column - II	
(a)	Net force acting on m_2 if F = 12 N	(p)	1 N
(b)	Net force acting on m_2 if F = 6 N	(q)	3 N
(c)	Net force acting on m_3 if F = 12 N	(r)	2 N
(d)	Net force acting on m_3 if F = 6 N	(s)	4 N

(A) (a – s), (b – r), (c – q), (d – p) (B) (a – s), (b – r), (c – r), (d – p)
(C) (a – q), (b – r), (c – s), (d – p) (D) (a – p), (b – s), (c – r), (d – p)

15. Statement – 1: Friction is self – adjusting force.
Statement – 2: The magnitude of static friction is less than the applied force.
(A) Both statement 1 and 2 are true and statement 2 is correct explanation of statement 1.
(B) Both statement 1 and 2 are true but statement is not a correct explanation of statement 1.
(C) Statement 1 is true and statement 2 is false.
(D) Statement 2 is true and statement 1 is false

16. The velocity time graph of a body in motion is a straight line inclined to the time-axis. The correct statement is
(A) velocity is uniform.
(B) acceleration is uniform.
(C) both velocity and acceleration are uniform.
(D) neither velocity nor acceleration is uniform.

17. Calculate the resultant force in the given figure.

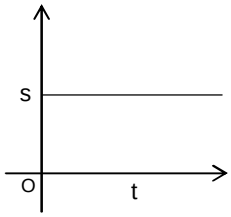


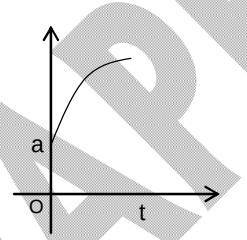
(A) 5 N toward left
(B) 15 N towards right
(C) 10 N towards right
(D) 10 N towards left

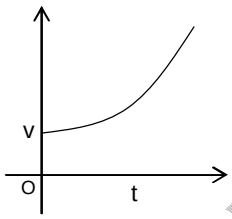
18. The time period of a geostationary satellite is
(A) 24 hours
(B) 12 hours
(C) 365 days
(D) One month

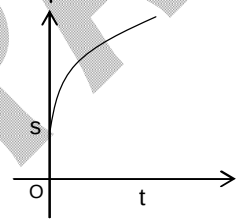
19. When we jump out of a boat standing in water it moves
(A) Forward
(B) Backward
(C) Sideways
(D) None of these

20. Which of the following graph shows retarding motion?

(A)


(B)


(C)


(D)


CHEMISTRY (PART – B)

*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. The mass per unit volume of a substance is called
(A) Gravity
(B) Weight
(C) Density
(D) None of these

22. The highly ordered arrangements of constituent particles in a solid is called
(A) Lattice
(B) Rigidity
(C) Compressibility
(D) Fluidity

23. A substance having a definite shape and definite volume is called
(A) Solid
(B) Liquid
(C) Plasma
(D) Gas

24. In summer, water kept in an earthen pot becomes cool because of
(A) Sublimation
(B) Diffusion
(C) Evaporation
(D) Osmosis

25. Boiling is
(A) an endothermic process
(B) an exothermic process
(C) neutralization process
(D) Both (B) & (C)

26. Name the solid that would sublime on heating
(A) Butter (B) Ice
(C) Ammonium chloride (D) Hydrogen

27. What is SI unit of density?
(A) kgm^{-3} (B) $kgmL^{-1}$
(C) gmL^{-1} (D) None of these

28. Classification is grouping things with _____properties together.
(A) same (B) similar
(C) different (D) all the three

29. Sugar can be recovered from its aqueous solution by:
(A) Filtration (B) Distillation
(C) Crystallization (D) Centrifugation

30. Which of the following term is not related to colloids?
(A) Tyndall effect (B) Coagulation
(C) Neutralization (D) Molecular solution

BIOLOGY (PART – C)

*This part contains **10 Multiple Choice Questions** number **31 to 40.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

31. Mitochondria are absent in
(A) Viruses (B) Blue green algae
(C) Bacteria (D) All of these

32. What is DNA?
(A) Deoxy acid (B) Ribose nucleic acid
(C) Deamine nucleic acid (D) Deoxy ribose nucleic acid

33. Average pH of blood is
(A) 10.0 (B) 6.2
(C) 9.0 (D) 7.4

34. Largest muscle of the body is
(A) Stapedicus (B) Quadriceps
(C) Gastronemium (D) Gluteus maximus

35. The cells of Apical meristem lacks
(A) Vacuoles (B) Cytoplasm
(C) Nucleus (D) Cell wall

36. Match the Column I Types of tissues with Column II Functions

Column – I Types of tissues		Column – II Functions	
1.	Aerenchyma	I.	Stores food
2.	Collenchyma	II.	Flexibility
3.	Parenchyma	III.	Buoyancy
4.	Chlorenchyma	IV.	Photosynthesis

(A) (1 – II), (2 – I), (3 – IV), (4 – III) (B) (1 – III). (2 – I), (3 – II), (4 – IV)
(C) (1 – IV), (2 – I), (3 – II), (4 – III) (D) (1 – III), (2 – II), (3 – I), (4 – IV)

37. Which cell organelle/ organelles in eukaryotic cells contain 70 S ribosomes
(A) Rough Endoplasmic Reticulum
(B) Chloroplast only
(C) Mitochondria only
(D) Both Chloroplast and Mitochondria

38. Match the Column I with Column II

Column – I		Column – II	
1.	Hypotonic solution	I.	Functional segment of DNA
2.	Hypertonic solution	II.	Nucleus
3.	Chromosomes	III.	Plant cell become Plasmolyzed
4.	Genes	IV.	Plant cell become turgid

(A) (1 – II), (2 – I), (3 – IV), (4 – III)
(B) (1 – IV), (2 – III), (3 – II), (4 – I)
(C) (1 – IV), (2 – I), (3 – II), (4 – III)
(D) (1 – III), (2 – I), (3 – IV), (4 – III)

39. Statement 1: Robert Brown discovered the nucleus
Statement 2: Nucleoplasm and cytoplasm of a living cell together form the protoplasm
(A) Statement 1 and 2 are correct and statement 2 explains the statement 1
(B) Statement 1 and 2 are correct but statement 2 does not explain the statement 1
(C) Statement 1 is true and statement 2 is false
(D) Statement 1 is false and statement 1 is true

40. Find out the correct statement/s from the options given below
(i) Mitochondria are rod shaped or sausage shaped cell organelles which are commonly called as the power house of the cell.
(ii) Mitochondria is a single membrane organelle and its wall is inwardly folded to from cristae.
(iii) Cristae has specialized structures called Oxysomes which serve as the site of ATP synthesis.
(iv) It has circular DNA and 80S type of ribosomes.
(A) Only statement (i) is correct
(B) Statement (i) and (iii) are correct
(C) Statement (iii) and (iv) are correct
(D) All the given statements are correct

Paper-1a (Section – III)

Time: 20 Minutes

MATHEMATICS (PART – A)

*This part contains **20 Multiple Choice Questions** number **41 to 60.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

41. Three vertices of a parallelogram are $(a+b, a-b)$, $(2a+b, 2a-b)$, $(a-b, a+b)$. Then the fourth vertex is

(A) $(b, -b)$ (B) $(-b, b)$

(C) $(a, -b)$ (D) (b, a)

42. If the two vertices of a triangle are (6, 3) and (-1, 7) and its centroid is (1, 5). Then the third vertex is

(A) $(2, 5)$ (B) $(2, -5)$

(C) $(-2, -5)$ (D) $(-2, 5)$

43. The vertices of a triangle are (1, 2), (h, -3) and (-4, k). Find the value of $\frac{\sqrt{(h+k)^2+(h+3k)^2}}{4}$, if the centroid of the triangle is at the point (5, -1).

(A) 2 (B) 5

(C) 6 (D) 8

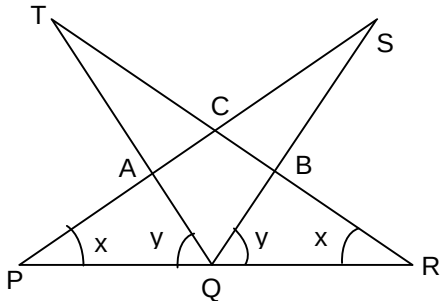
44. In the figure , if $AQ = QB$, then which of the following is correct

(A) $PQ = AP$

(B) $TB = BR$

(C) $PQ = QR$

(D) $SA = AP$



45. Area of an isosceles triangle with base as 'a' and its equal sides of length 'x' is

(A) $\frac{1}{2}\left(a \times \sqrt{x^2 - a^2}\right)$ (B) $\frac{1}{2}\left(a \times \sqrt{x^2 - \frac{a^2}{2}}\right)$

(C) $\frac{1}{2}\left(a \times \sqrt{x^2 - \frac{a^2}{4}}\right)$ (D) None of these

46. Line $2x + 3y = 7$ intersects x-axis at the point

(A) (2, 6) (B) $\left(0, \frac{7}{2}\right)$

(C) (0, 2) (D) $\left(\frac{7}{2}, 0\right)$

47. Which of the following points are equidistant from y –axis?
(A) (3, 1) and (–3, 2) (B) (0, 1) and (1, 0)
(C) (4, 2) and (5, 1) (D) (1, 1) and (–2, 1)

48. If $x+1$ is a factor of the polynomial $2x^2+kx$, then k=?
(A) – 2 (B) - 3
(C) 4 (D) 2

49. If $f(x)$ be a polynomial such that $f\left(-\frac{1}{2}\right)=0$ then a factor of f(x) is
(A) 2x – 1 (B) 2x + 1
(C) x – 1 (D) x + 1

50. The factors of x^3-7x+6 are
(A) $x(x-6)(x-1)$ (B) $(x^2-6)(x-1)$
(C) $(x+1)(x+2)(x-3)$ (D) $(x-1)(x+3)(x-2)$

51. The value of $\frac{\sqrt{48}+\sqrt{32}}{\sqrt{27}+\sqrt{18}}$ is
(A) $\frac{4}{3}$ (B) 4
(C) - 4 (D) $\frac{3}{4}$

52. In which quadrant, does the point (–3, 7) lie?
(A) Q_1 (B) Q_2
(C) Q_3 (D) Q_4

53. If $x+\sqrt{15}=4$ then $x+\frac{1}{x}=?$
(A) 2 (B) 4
(C) 8 (D) 1

54. If $10^x=64$, what is the value of $10^{\frac{x}{2}+1}$?
(A) 18 (B) 42
(C) 80 (D) 81

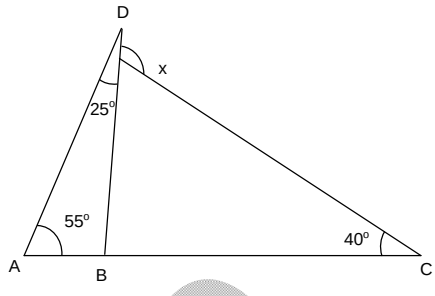
55. If $x^{-2}=64$, then $x^{1/3}+x^0=$
(A) 2 (B) 3
(C) 3/2 (D) 2/3

56. If $2^x=3^y=6^{-z}$, then $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}$ is equal to
(A) 2 (B) 3
(C) 1 (D) 0

57. In the figure, find the value of x

(A) 100° (B) 120°

(C) 140° (D) 160°



58. If HCF of $(x-1)^3(x-2)^2(x-a)$ and $(x-b)(x-1)^5$ is $(x-1)^4(x-2)$, then

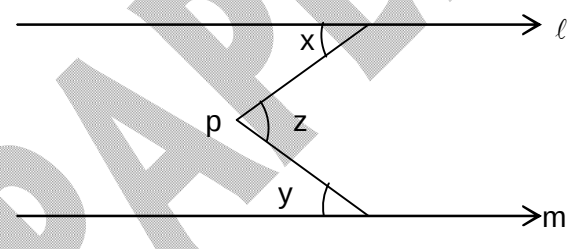
(A) $b^a + a = 4$ (B) $b^a + a^b$ is prime number

(C) $b^a - a = 3$ (D) $\sqrt{b^a + a^b}$ is rational number

59. In the given figure, if $\ell \| m$, find the value of z, if x is two-third of y which is a complement of 45°.

(A) 75° (B) 60°

(C) 80° (D) 90°



60. If the sum of two angles of a triangle is 90^o and their difference is 30^o, then angles of triangle are

(A) $30^o, 60^o, 90^o$ (B) $20^o, 70^o, 90^o$

(C) $40^o, 50^o, 90^o$ (D) $15^o, 75^o, 90^o$

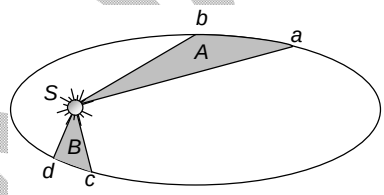
Paper-1b (Section – IV)

Time: 30 Minutes

PHYSICS (PART – A)

*This part contains **2 Multiple Choice Questions** number **61 to 62.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

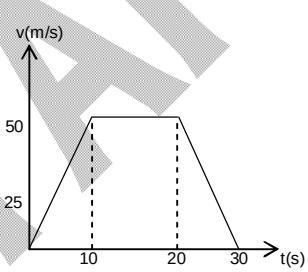
61. The figure shows the motion of a planet around the sun in an elliptical orbit with sun at the focus. The shaded areas A and B are also shown in the figure which can be assumed to be equal. If t_1 and t_2 represent the time for the planet to move from *a* to *b* and *d* to *c* respectively, then



(A) $t_1 < t_2$ (B) $t_1 > t_2$

(C) $t_1 = t_2$ (D) $t_1 \le t_2$

62. Figure shows velocity time graph for a particle in rectilinear motion. Find the displacement covered by the object in thirty seconds



(A) 500 m
(B) 750 m
(C) 650 m
(D) 1000 m

CHEMISTRY (PART – B)

*This part contains **2 Multiple Choice Questions** number **63 to 64.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

63. Which of the following is not a compound?

(A) $Na_2SO_4.10H_2O$ (B) $KCl.MgCl_2.6H_2O$

(C) $CaCO_3.MgCO_3$ (D) Na-Hg amalgam

64. Which of the following process(es) should be used in order to separate ozone from its mixture with carbon dioxide?

(A) Dissolution in water (B) Decompression

(C) Filtration (D) Fractional distillation

MATHEMATICS (PART – C)

*This part contains **2 Multiple Choice Questions** number **65 to 66.** Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

65. If AB is the diameter of a circle and A(a, 4b) and $B(3a, 3b+1)$. Find the value of 'a' and 'b' given that the centre of the circle is at (4, 11)

(A) a = –2, b = 3 (B) a = 4, b = 3

(C) a = 2, b = 3 (D) a = –2, b = –3

66. In ΔABC, if $\angle A + \angle B = 110^\circ$, $\angle B - \angle A = 10^\circ$, then shortest side is

(A) AB (B) BC

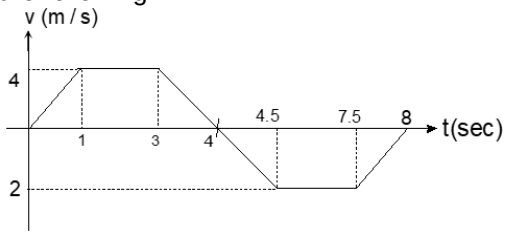
(C) CA (D) can't be determined

PHYSICS (PART – D)

*This part contains **ONE (01)** comprehension. Based on comprehension, there are **THREE (03)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 67 to 69

The velocity time graph of a linear motion is shown in figure.
Answer the following.



67. Displacement of a particle in 8 sec is
(A) 5 m (B) 16 m
(C) 8 m (D) 6 m

68. Average speed of a particle in 8 sec is
(A) $\frac{5}{8}$ m / s (B) $\frac{19}{8}$ m / s
(C) 0 m/s (D) 3 m/s

69. Distance of a particle in 8 sec is
(A) 15 m (B) 16 m
(C) 18 m (D) 19 m

CHEMISTRY (PART – E)

*This part contains **ONE (01)** comprehension. Based on comprehension, there are **THREE (03)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 70 to 72

The clouds consists of charge particles of water dispersed in air. Some of them are +vely charged, others are –vely charged. When similar charged clouds come closer they cause lightening and thundering whereas, when +ve and –ve charge clouds some closer they cause heavy rain by aggregation of minute particles. It is possible to cause artificial rain by throwing electrified sand or silver iodide from an aeroplane and thus coagulating the mist hanging in air

70. Clouds are colloidal dispersions of:
(A) water in air (B) Air in water
(C) Air in solid (D) Solid in air

71. The dispersion of liquid or solid in air is called
(A) aerosol (B) foam
(C) gels (D) sol

72. Which of the following is homogeneous?
(A) Milk (B) Paint
(C) Shampoo (D) Vinegar

MATHEMATICS (PART – F)

*This part contains **ONE (01)** comprehension. Based on comprehension, there are **THREE (03)** questions of **Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.*

Comprehension for Q. No. 73 to 75

Let A and B be two given points whose co-ordinates are given by $A(x_1, y_1)$ and $B(x_2, y_2)$ respectively.

Then $AB = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ and mid-point of AB is $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$.

73. If (9, a) is at the distance of 5 units from the point (a, 2), then the value of a is
(A) 6 (B) 3
(C) 4 (D) 7

74. The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is
(A) 10 (B) 12
(C) 14 (D) 16

75. Which of the following points is not 10 units from the origin?
(A) $(-6, 8)$ (B) $(8, -6)$
(C) $(-6, -8)$ (D) $(6, 4)$

BIG BANG EDGE TEST

SAMPLE PAPER

For Students presently in Class IX

Paper 1 (Paper-1a+1b) NTSE – MENTAL ABILITY, SCIENCE & MATHEMATICS and JEE Main

Paper Code: 910-1

ANSWER KEYS

1.	**D**	2.	**C**	3.	**D**	4.	**B**
5.	**D**	6.	**C**	7.	**D**	8.	**B**
9.	**B**	10.	**C**	11.	**A**	12.	**D**
13.	**B**	14.	**B**	15.	**C**	16.	**B**
17.	**C**	18.	**A**	19.	**B**	20.	**D**
21.	**C**	22.	**A**	23.	**A**	24.	**C**
25.	**A**	26.	**C**	27.	**A**	28.	**B**
29.	**C**	30.	**C**	31.	**D**	32.	**D**
33.	**D**	34.	**D**	35.	**A**	36.	**D**
37.	**D**	38.	**B**	39.	**B**	40.	**B**
41.	**B**	42.	**D**	43.	**B**	44.	**C**
45.	**C**	46.	**D**	47.	**A**	48.	**D**
49.	**B**	50.	**D**	51.	**A**	52.	**B**
53.	**C**	54.	**C**	55.	**C**	56.	**D**
57.	**B**	58.	**B**	59.	**A**	60.	**A**
61.	**C**	62.	**D**	63.	**D**	64.	**D**
65.	**C**	66.	**B**	67.	**A**	68.	**B**
69.	**D**	70.	**A**	71.	**A**	72.	**D**
73.	**A**	74.	**B**	75.	**D**		