MOMENTUM

PRE-FOUNDATION

(A Division of Momentum Education Pvt. Ltd)

DATE :	DURATION: 2 HRS.	MARKS: 280

MTSE
(MODEL PAPER)

MTSE
MOMENTUM TALENT SEARCH EXAM

TEST ID-2103

CLASS: 8 (MOVING TO CLASS 9)   **TEST NO - 1**

INSTRUCTIONS

A.   GENERAL

1.   **Please read the Instructions carefully, You are allotted 10 minutes specially for this purpose.**

2.   Blank papers, clip boards, log tables, slide rule, calculators, mobiles or any other electronic instrument in any form is **"NOT PERMISSIBLE".**

3.   Before starting the paper, fill up the required details in the blank spaces provided in the answersheet.

4.   Using a **Blue/ Black Pen,** darken the bubbles on the **OMR sheet**.

5.   **DO NOT TAMPER WITH/MUTILATE THE OMR OR THE BOOKLET.**

6.   No rough sheets will be provided by the invigilators. All the rough work is to be done in the blank space povided in the question paper.

B.   FILLING THE RIGHT PART OF THE OMR

7.   Write your name, Bach and the Father's name in the boxes provided on the right part of the OMR. Do not write any of this information anywhere else. Darken the appropriate bubble under each digit of your Student ID Number and Test ID Number.

8.   Do not fold or make any stray marks on the Answer Sheet.

9.   On completion of the test, the candidate must hand over the Answer Sheet & Test Booklet to the Invigilator on duty in the Room / Hall.

10.   Follow instructions by invigilator/Centre Superintendent (If any).

11.   **Please fill in all the correct information on back page of this paper.**

C.   QUESTION PAPER FORMAT :

This Question Paper consists of 70 objective type questions.

D.   MARKING SCHEME :

- 4 Marks will be awarded for each Correct Answer.
- 1 Mark will be deducted for each incorrect Answer.
- 0 Marks will be awarded for unattempted Questions

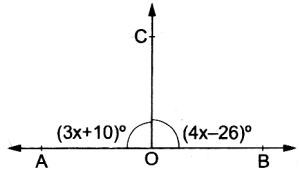| Name of the Candidate	Candidate ID
I have read all the instructions and shall abide by them	I have verified all the information filled in by the Candidate
.... Signature of the Candidate	.... Signature of the Invigilator

MOMENTUM

Mathematics [Part- I]

1. If $x = \dfrac{1}{2}$, then find the value of $x + \cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{x}}}$.

   (A) $\dfrac{5}{4}$ (B) $\dfrac{4}{5}$ (C) $\dfrac{3}{4}$ (D) $\dfrac{4}{3}$

2. Identify a rational number between $\dfrac{1}{3}$ and $\dfrac{4}{5}$.

   (A) $\dfrac{1}{4}$ (B) $\dfrac{9}{10}$ (C) $\dfrac{17}{30}$ (D) $1\dfrac{7}{10}$

3. Given that $9^n + 9^n + 9^n = 3^{2013}$, what is the value of n?

   (A) 1005   (B) 1006   (C) 2011   (D) 6019

4. What is the value of $\dfrac{(67.542)^2 - (32.458)^2}{75.458 - 40.374}$?

   (A) 1   (B) 10   (C) 100   (D) 1000

5. If 5% more is gained by selling an article for ₹ 350 than by selling it for ₹ 340, what is the cost of the article?

   (A) ₹ 50   (B) ₹ 160   (C) ₹ 200   (D) ₹ 225

6. Identify the value of x in the equation given.

   $$\dfrac{x}{x-a} + \dfrac{x}{x-b} = 2$$

   (A) $\dfrac{a}{b}$ (B) ab   (C) $\dfrac{2ab}{a+b}$ (D) 2ab

7. What is the present worth of ₹ 169 due in 2 years at 4% per annum compound interest?

   (A) ₹ 150.50   (B) ₹ 154.75   (C) ₹ 156.25   (D) ₹ 158

8. The sides of a triangle are (3p – 4) cm, (2p – 5) cm and (2p + 5) cm. Which of the following expressions gives its perimeter?

   (A) (7p – 4) cm   (B) (5p + 5) cm

   (C) 5p – 7 cm   (D) 7p + 4cm

9. The product 864×n is a perfect cube. What is the smallest possible value of 'n' ?

   (A) 2   (B) 1   (C) 4   (D) 3

10. Which of the following best describes the triangle of sides $\sqrt{2}$, $\sqrt{3}$ and $\sqrt{11}$?

    (A) Right angled   (B) Acute

    (C) Obtuse   (D) Does not exist

Space for rough work

MOMENTUM

11. The cost of a notebook is ₹ $3a^2 - 4ab + 6b^2$. How much does $5a^2b^2$ notebooks cost?

(A) ₹ $15a^4b^2 - 20a^3b^3 + 30a^2b^4$
(B) ₹ $15a^4b^2 + 20a^3b^3 + 30a^2b^4$
(C) ₹ $15a^4b^2 - 20a^3b^3 - 30a^2b^4$
(D) ₹ $15a^4b^2 + 20a^3b^3 - 30a^2b^4$

12. If $p = \sqrt{-1}$, what is the value of $(1 - p)^{20}$?

(A) $-p$ (B) -1024
(C) 1024 (D) $1 - p$

13. $\sqrt[4]{(64)^{-2}} = ?$

(a) 4   (b) $\dfrac{1}{4}$ (c) 8   (d) $\dfrac{1}{8}$

14. The simplest form of 0.123 is

(a) $\dfrac{16}{45}$ (b) $\dfrac{32}{99}$

(c) $\dfrac{29}{90}$ (d) none of these

15. If $x = (7 + 4\sqrt{3})$, then $\left(x + \dfrac{1}{x}\right) = ?$

(a) $8\sqrt{3}$ (b) 14   (c) 49   (d) 48

16. Which of the following is a polynomial?

(a) $x - \dfrac{1}{x} + 2$ (b) $\dfrac{1}{x} + 5$

(c) $\sqrt{x} + 3$ (d) -4

17. Zero of the polynomial $p(x) = 2x + 3$ is

(a) $\dfrac{3}{2}$ (b) $\dfrac{-3}{2}$ (c) $\dfrac{-2}{3}$ (d) $\dfrac{1}{2}$

18. $(x + 1)$ is a factor of the polynomial

(a) $x^3 - 2x^2 + x + 2$ (b) $x^3 + 2x^2 + x - 2$
(c) $x^3 + 2x^2 - x - 2$ (d) $x^3 + 2x^2 - x + 2$

19. In the given figure, AOB is a straight line. If $\angle AOC = (3x + 10)^\circ$ and $\angle BOC = (4x - 26)^\circ$, then $\angle BOC = ?$

(a) 96°
(b) 86°
(c) 76°
(d) 106°

20. The sides of a triangle are in the ratio $5 : 12 : 13$ and its perimeter is 150 cm. the area of the triangle is

(a) 375 cm^2 (b) 750 cm^2
(c) 250 cm^2 (d) 500 cm^2

Space for rough work

21. If the mean of five observations x, x + 2, x + 4, x + 6 and x + 8 is 11, then the value of x is

(a) 5   (b) 6   (c) 7   (d) 8

22. In the given figure, $\triangle$ ABC and $\triangle$ DBC are inscribed in a circle such that $\angle$ BAC = 60° and $\angle$ DBC = 50°

Then, $\angle$ BCD = ?

(a) 50°
(b) 60°
(c) 70°
(d) 80°

23. Which of the following angles can be constructed using ruler and compass only ?

(a) 65°   (b) 72°   (c) 80°   (d) 67.5°

24. The length, breadth and height of a cuboid are 15cm, 12 cm and 4.5 cm respecively. Its volume is

(a) 243 cm³   (b) 405 cm³

(c) 810 cm³   (d) 603 cm³

25. The median of the numbers 4, 4, 5, 7, 6, 7, 7, 12, 3 is

(a) 4   (b) 5   (c) 6   (d) 7

Space for rough work

26. The distance travelled by a body is directly proportional to the square of the time taken. Its acceleration:

(a) Increases   (b) Decreases   (c) Becomes zero   (d) Remains constant

27. A box of mass 12 kg is sliding with a constant velocity of 24 m/s on a frictionless horizontal table. The force required to keep the body moving with the same velocity is :

(a) 48 Newton   (b) 6 Newton   (c) 2 Newton   (d) None of the above

28. The quantity on which the loudness of sound depends has its unit as :

(a) Hertz   (b) Seconds   (c) Meter per second   (d) Meter

29. When a wave travels through a medium :

(a) Particles are transferred from one place to another

(b) Energy is transferred in a periodic manner

(c) Energy is transferred at a constant speed

(d) None of the above

30. A man is pulling a rope attached to a block on a smooth horizontal table. The tension in the rope will be the same at all points :

(a) If and only if the rope is not accelerated

(b) If and only if the rope is massless

(c) If either the rope is not accelerated or is massless

(d) Always

31. A cylinder rolls up an inclined plane, reaches some height, and then rolls down (without slipping throughout these motions). The directions of the frictional force acting on the cylinder are :

(a) Up the incline while ascending and down the incline while descending

(b) Up the incline while ascending as well as descending

(c) Down the incline while ascending and up the incline while descending

(d) Down the incline while ascending as well as descending

32. A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 meters, what will be his speed ? (take $\pi = \dfrac{22}{7}$)

(a) 2.3 m/s   (b) 3.5 m/s   (c) 4.5 m/s   (d) 5.5 m/s

Space for rough work

33. A particle moves on the x-axis. When its acceleration is positive and increasing :

(a) Its velocity must be positive
(b) Its velocity must be negative

(c) It must be slowing up
(d) None of the above must be true

34. A concave mirror of focal length f produces an image n times the size of the object. If the image is real then the distance of the object from the mirror is :

(a) $(n-1)f$
(b) $\dfrac{(n-1)}{n}f$
(c) $\dfrac{(n+1)}{n}f$
(d) $(n+1)f$

35. A plane mirror is approaching you at 10 cm/s. You can see your image in it. At what speed will your image approach you ?

(a) 10 cm/s
(b) 5 cm/s
(c) 20 cm/s
(d) 15 cm/s

36. Synthetic fibres are -

(a) Monomers
(b) Oligomers
(c) Polymers
(d) Dimers

37. Wood pulp mainly contains -

(a) Sucrose
(b) Cellulose
(c) Maltose
(d) None

38. The metal which is liquid at room temprature is -

(a) Sodium
(b) Zinc
(c) Gold
(d) Mercury

39. Amongst 64 gm SO_2, 44 gm CO_2, and 34 gm H_2S, which have greater number of molecules ?

(a) H_2S
(b) SO_2
(c) CO_2
(d) None

40. Sulphur dioxide is -

(a) Basic oxide
(b) Acidic oxide
(c) Oxide
(d) None

41. Water has highest density at -

(a) $-4°C$
(b) $4°C$
(c) $0°C$
(d) $100°C$

42. Dry Ice is a -

(a) Liq. CO_2
(b) Solid H_2O
(c) Liq. H_2O
(d) Solid CO_2

43. Changing $-40°C$ into Kelvin we get -

(a) 173 Kelvin
(b) 233 Kelvin
(c) 240 Kelvin
(d) -233 Kelvin

Space for rough work

44. Mixture of Butane, ethane and propane is called -

(a) Coal gas   (b) Producer gas   (c) Petrolium gas   (d) Oil gas

45. The SI Unit of temprature is

(a) ^{o}C (b) K   (c) ^{o}F (d) All the above

46. Rearing of fishesonlarge scale is called as

(a) Apiculture   (b) Pisciculture   (c) Poultry farming   (d) Dairy Farming

47. Which of the following methods will not help in replenishment of soil with nutrients ?

(a) Fallowing   (b) Crop Rotation   (c) Addition of manures (d) Tilling

48. Which of the following is a plantation crop ?

(a) Rice   (b) Barley   (c) Coffee   (d) Beetroot

49. Pasteurization of milk destroys the

(a) Vitamins   (b) Fat Conent   (c) Bacteria   (d) Yeast

50. The process of conversion of sugar into alcohol is called

(a) Fermentation   (b) Moulding   (c) Nitrogen Fixation   (d) Infection

51. Animals that are exclusively found in an area are called

(a) Endangered animals (b) Endemic animals   (c) Wild animals   (d) Extinct animals

52. Two way movments of animals to other place for food, breeding etc. is called

(a) Transfer   (b) Hibernation   (c) Extinction   (d) Migration

53. Whole set of ecosystem is protected in a

(a) Wild life sanctuary   (b) National park   (c) Zoo   (d) Botanical garden

54. The colour of chloroplast is green due to presence of

(a) Proteins   (b) Stain   (c) Chlorophyll   (d) Coloured water

55. Which type of ribosomes are present in bacterial call ?

(a) 70s   (b) 60s   (c) 50s   (d) 40s

Space for rough work

Direction for Q. No. 56 to 57 : The wrong term out of the given alternatives in the following series

56. 2, 6, 12, 20, 30, 42, 54, 72

    (A) 20   (B) 30   (C) 42   (D) 54

57. $\frac{1}{18}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, 2, 4, 8

    (A) $\frac{1}{18}$ (B) $\frac{1}{8}$ (C) $\frac{1}{4}$ (D) $\frac{1}{2}$

58. The number of cubes in the following figure is

    (A) 12   (B) 13   (C) 14   (D) 15

Direction for Q. No. 59 to 60 : Find the missing number.

59.

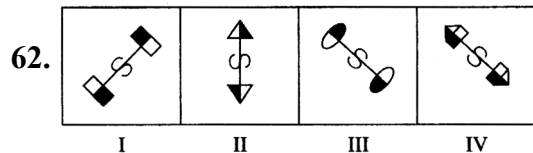   (A) 18   (B) 16   (C) 15   (D) 12

60.

9	18	27
?	24	36
5	10	15

    (A) 14   (B) 6   (C) 8   (D) 12

Direction for Q. No. 61 to 62 : Find the odd one out

61.

    (A) I   (B) II   (C) III   (D) IV

62.

    (A) I   (B) II   (C) III   (D) IV

63.
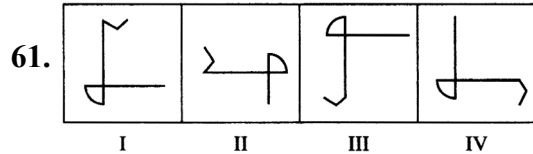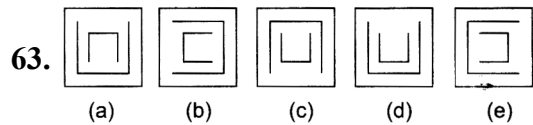
    (A) a   (B) c   (C) d   (D) e

Space for rough work

64. Select the correct group of letters from given alternatives which complete series.

a_bbc_aab_cca_bbcc
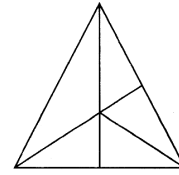
(A) bacb   (B) acba   (C) abba   (D) caba

65. A travelled westward 5 km, turned left and travelled 3 km, turned right and travelled 9 km. He then travelled 3 km north. How far he is from the starting pont ?

(A) 5 km   (B) 3 km   (C) 6 km   (D) 14 km

66. Find which one word can not be made from the letters of the word 'TEACHER'.

(A) REACH   (B) CHAIR
(C) CHEER   (D) SEARCH

67. How many triangles are there in the given figure?

(A) 12   (B) 9   (C) 10   (D) 8

68. In a family, the father took 1/4 of the cake and he had 3 times as much as each of the other members had. The total number of family members is :

(A) 3   (B) 10   (C) 12   (D) 7

69. Which term comes next in the sequence AC, FH, KM, PR, ?

(A) UW   (B) VW   (C) UX   (D) TV

70. Choose the best alternative 121 : 12 : : 25 : ?

(A) 1   (B) 2   (C) 6   (D) 7

Space for rough work

C. **QUESTION PAPER FORMAT**

The question paper consists of 3 parts I, II & III Mathematics, Science & Reasoning respectively.

D. **MARKING SCHEME**

There are three parts in the question paper. The distribution of marks subjectwise in each part is as under for each correct response :

PART	SUBJECT	QUESTION NO.	MARKS
Part - I	MATHEMATICS	01 to 25	4
Part - II	SCIENCE	26 to 55	4
Part - III	REASONING	56 to 70	4

You must fill the bubble in OMR in following manner. For example if only 'b' choice is correct then

A   B   C   D

◯   ●   ◯   ◯

If you fill the bubble for any option other than the correct option then, your response will be considered *incorrect. 1/4 (one four) of allotted marks i.e. 1 mark* if a question carries 4 marks will be deducted for indicating incorrect response of each question. No. deduction from the total score will be made if no response is indicated for a question in the answer sheet.

GENERAL INFORMATION

Fill by the candidate :-   Candidate ID : _____

1.   Candidate Name :_____

2.   Father's Name : _____

3.   Mother's Name : _____

4.   Category :   ☐ GEN   ☐ OBC   ☐ SC   ☐ ST

5.   Mobile No.   1.(G) _____ 2. (P) _____

6.   NTSE Qualified ☐Y   ☐N   7. KVPY ☐Y ☐N   8. OLYMPIAD ☐Y   ☐N

9.   Board   ☐ CBSE   ☐ ICSE / ISC ☐ U.P.   Others : _____

10. Last Class :   _____%_____10th %_____12th %_____

11. Last School Name : _____City_____

12. Any other achievement : _____

13. Have you attempted any admission test before : ☐Y   ☐N _____

14. Old student of Momentum or admitted : ☐Y   ☐N   If yes,St.Id_____/Batch_____

Disclamer :
I hereby solemnly and sincerely affirm that all the particulars stated by me in this form are true and correct. However, if any information furnished herein is found false, wrong, incorrect or inaccumate, I understand that my candidate for Admission Test-2021 will be cancelled and lead to cancellation of the test result.

Candidate Signature _____   Invigilator Signature_____

MOMENTUM

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