Maths

Course Outline

- ⊙ **Probability**
- ⊙ **Statistics**

MAT

(Monthly Achievement Tests)

Short Code: 447310

Test ID: NMM09U100

Guide Lines

1. Each set consists of:

    50 | Warm-up/Foundation Questions

    30 | Regular Questions

    20 | Thinking Ability Questions

2. The time allocation and instructions regarding the questions are printed clearly in the beginning of each question types. The answers should be written or tick marked as per the instructions given. It is suggested to use pencil initially, so as to enable you to reuse the practice papers.

3. **According to the new pattern of CBSE these practice papers will be very useful especially for syllabus related Quiz, Debates, Visuals related checking and Orals etc.,**

4. After marking the answers, the scores of students can be checked and for marks obtained guidelines are given along with the question solving instructions. Follow those instructions and if, you are fully satisfied with your performance then check for your expected grades as per the CBSE guidelines as given on the back of each set.

5. Remember that this is only a guideline not the finally worked out result. You can further improve your performance by increase your practice.

6. For your convenience please follow following essential examiner's advices:

    a. Answer all the questions
    b. Read all the Options carefully
    c. Understand and use correct scientific language in your responses.

We from ⬡ **wish skillful learning for your bright future.**

Before going for the test, look at least :

1. First of all go through the syllabus of the test according to the **Course Outline** provided at the front page of each MAT.

2. After going through the syllabus once or twice or even more time as per your satisfaction, first of all do the Warm-up questions. If you score A+ grade in those 50 questions go to the next level otherwise go through the chapter again.

3. The box for **Specific Information** is very useful as it adds to your concept building. Try to fill specific information in the proper way so that you will get the maximum benefit of it.

4. **Let's Chat** portion will help you to prepare for oral assessment. Through this you can increase your capacity to interact on a particular topic related to your syllabus.

5. The **Extra Diet** portion is also there to enhance you knowledge through visulization of concept. This portion provides you added knowledge on various related concepts.

6. The information related to time factor is there to enhance your time management skills.

7. From the examiners point of view it is always advised to use Pencil for initial efforts. The use of pen is fruitful only when the final effort comes.

Examiner's Tips:

☞ Read the question carefully. Make sure you understand exactly what is required.

☞ If you find that you are unable to do a part of a question, do not give up. The next part may be easier and may provide a clue to what you might have done in the part you found difficult.

☞ Note the number of marks per question as guide to the depth of response needed.

☞ Underline or note the key words that tell you what is required.

☞ Underline or note data as you read the question.

☞ Structure your answer carefully.

☞ Show all steps in calculations. Include equations you use and show the substitution of data. remember to work according to units given.

☞ Make sure that your answers contain suitable significant figures (wherever necessary) and must include units in numericals.

☞ Draw diagrams and graphs carefully.

☞ Read data from graphs carefully; note scales and prefixes on axes.

☞ Keep your eye on the clock but don't panic.

☞ If you have time at the end, use it. Check that your descriptions and explanations make sense. Consider whether there is anything you could add to an explanation or description. Repeat calculations to ensure that you have not made a mistake.

Opening Window

To enlighten your fundamental/basic topic knowledge.

A+. If you score 45 or above marks, move to the next section confidently.

A. If you score between 40 and 45 marks, it is satisfactory. Bit more knowledge will bring excellent result.

B. If you score below 40, kindly go through the topic more seriously.

Section A (50 marks)   **Time given – 50 minutes + 5 minutes for revision**

Questions 1 to 50 carry 1 mark each.

Given one of them is the correct answer make your choice and write its name (a, b, c or d) in the answer box provided.

1. Class mark of class interval 15 – 25 is

    (a) 15   (b) 25

    (c) 20   (d) none of these

    T – 1 min
    S – Statistics

    Ans.

2. Find the mode fo the given data 2, 2, 3, 3, 2, 5, 4, 3, 2, 4, 2

    (a) 2   (b) 3

    (c) 5   (d) 4

    T – 1 min
    S – Statistics

    Ans.

3. Facts or figures collected with a definite purpose are called

    (a) data   (b) histogram

    (c) median   (d) mode

    T – 1 min
    S – Statistics and statistical data

    Ans.

4. If n (number of observations) is an odd number then the median is

    (a) $\dfrac{n^{th}}{2}$ observation

    (b) $\left(\dfrac{n+1}{2}\right)^{th}$ observation

    (c) $\dfrac{n}{2}+1^{th}$ observation

    (d) $\dfrac{n^{th}}{2}$ & $\left(\dfrac{n}{2}+1\right)^{th}$ observation

    T – 1 min
    S – Statistics and statistical data

    Ans.

5. Find the mean of the cubes of the first four natural numbers.

   (a) 20   (b) 15

   (c) 25   (d) 18

   | T | – 1 min |
   | S | – Statistics and statistical data |

   Ans.

6. The mean of 8 numbers is 25. If each number is multiplied by 3, what will be the mean?

   (a) 60   (b) 55

   (c) 70   (d) 75

   | T | – 1 min |
   | S | – Statistics and statistical data |

   Ans.

7. The area of study dealing with the presentation, analysis & interpretation of data.

   (a) Probability   (b) Trigonometry

   (c) Statistics   (d) Geometry

   | T | – 1 min |
   | S | – Statistics and statistical data |

   Ans.

8. The lower limit of the class interval 45 – 50 is

   (a) 45   (b) 50

   (c) 47.5   (d) none of these

   | T | – 1 min |
   | S | – Statistics and statistical data |

   Ans.

9. For what value of x, is the mode of the following data 17 ?
   15, 16, 17, 14, 17, 16, 13, x, 17, 16, 15, 15.

   (a) 12   (b) 15

   (c) 17   (d) 16

   | T | – 1 min |
   | S | – Statistics and statistical data |

   Ans.

10. From a well shuffled deck of 52 cards. Probability of drawing 3.

   (a) $\dfrac{1}{13}$ (b) $\dfrac{1}{26}$

   (c) $\dfrac{1}{52}$ (d) none of these

   | T | – 1 min |
   | S | – Probability |

   Ans.

11. Probability of getting no tail, on tossing two coins simultaneously :

   (a) 1/4   (b) 2/4

   (c) 3/4   (d) 1

   | T | – 1 min |
   | S | – Probability |

   Ans.

12. In a bag there are 5 red balls, 7 black balls. Probability of getting green balls is

(a) 0   (b) 7/12

(c) 5/12   (d) 1

| T | – 1 min |
| S | – Probability |

Ans.

13. Class size of the class interval 5 – 15 is

(a) 5   (b) 15

(c) 10   (d) can not be determined

| T | – 1 min |
| S | – Class interval |

Ans.

14. Mean of first 8 natural numbers is

(a) 2.5   (b) 6

(c) 3.5   (d) 4.5

| T | – 1 min |
| S | – Mean |

Ans.

15. A coin is tossed 15 times and observed that 11 times head comes up. The probability that a tail comes up

(a) 4/11   (b) 11/15

(c) 4/15   (d) 15/11

| T | – 1 min |
| S | – Probability |

Ans.

16. Probability of getting tail on a throw of a coin is

(a) 0   (b) 1/2

(c) 1/3   (d) 1

| T | – 1 min |
| S | – Probability |

Ans.

17. Probability of getting 5 on throw of a dice is

(a) 0   (b) 2/6

(c) 1   (d) 1/6

| T | – 1 min |
| S | – Probability |

Ans.

18. Probability of drawing a queen of heart is

(a) $\dfrac{13}{52}$ (b) $\dfrac{5}{52}$

(c) $\dfrac{10}{52}$ (d) $\dfrac{1}{52}$

| T | – 1 min |
| S | – Probability |

Ans.

19. The lower limit of the class interval 45 – 50 is

(a) 45   (b) 50

(c) 47.5   (d) none of these

| T | – 1 min |
| S | – Class interval |

Ans.

20. Find the mean of all factors of 8

(a) 3.5   (b) 4.5

(c) 3.75   (d) 4.25

T	– 1 min
S	– Statistics

Ans.

Fill in the blanks

21. The most frequently occurring _____ is known as mode.

T	– 1 min
S	– Statistics

Ans.

22. _____ the middle most observation

T	– 1 min
S	– Median

Ans.

23. It is obtained by adding all the values of the observations and dividing it by the total number of observation. It is known as _____ .

T	– 1 min
S	– Statistics

Ans.

24. Probability of getting no head is _____ .

T	– 1 min
S	– Probability

Ans.

25. A _____ of a triangle divides it into two triangles of equal areas.

T	– 1 min
S	– Median

Ans.

26. When the data is collected from a source, which already has the information stored, then the data is called _____ .

T	– 1 min
S	– Statistics

Ans.

27. Class mark = _____ .

T	– 1 min
S	– Class mark

Ans.

28. The polygon obtained by joining the mid points of upper horizontal sides of all the rectangles in a histogram is known as _____ .

T – 1 min
S – Frequency polygons

Ans.

29. The probability of an event lies between _____ and _____ .

T – 1 min
S – Probability

Ans.

30. If n is an even number, the median is _____ .

T – 1 min
S – Statistics

Ans.

True or False

31. Algebraic sum of the deviations of a set of values from their arithmetic mean is 0.

T – 1 min
S – Statistics and statistical data

Ans.

32. The difference of the highest and the lowest values in the data is called the range of the data.

T – 1 min
S – Statistics and statistical data

Ans.

33. The number of times of an observation occurs in the given data, is called mode of the observation.

T – 1 min
S – Statistics and statistical data

Ans.

34. Facts or figures, collected with a definite purpose, are called statistics.

T – 1 min
S – Statistics and statistical data

Ans.

35. Algebraic sum of the deviations of a set of values from their arithmetic mean is 0.

T	– 1 min
S	– Arithmetic mean

Ans.

36. A trial is an action which results in one or several outcomes.

T	– 1 min
S	– Probability

Ans.

37. The difference of the highest and the lowest values in the data is called the range of the data.

T	– 1 min
S	– Range

Ans.

38. The sum of all the probabilities is 0.

T	– 1 min
S	– Probability

Ans.

39. An event for an experiment is the collection of some outcomes of the experience.

T	– 1 min
S	– Probability

Ans.

40. Graphical representation of marks with cumulative frequency is known as ogive.

T	– 1 min
S	– Statistics

Ans.

Simple Questions

41. Find the mean of all the factors of 12.

T	– 1 min
S	– Statistics

Ans.

42. What is the probability that a non-leap year will have 53 Sundays?

| T | – 1 min |
| S | – Probability |

Ans.

43. 1000 tickets of a lottery were sold and there are 5 prizes on these tickets. If Shanti has purchased one lottery ticket probability of losing a prize.

| T | – 1 min |
| S | – Probability |

Ans.

44. If the arithmetic mean of 6, 10, x and 12 is 8, find the value of x.

| T | – 1 min |
| S | – Statistics |

Ans.

45. Find the arithmetic mean of squares of first five natural numbers?

| T | – 1 min |
| S | – Statistics |

Ans.

46. A fair coin is tossed repeatedly. If the tail appears on first four tosses, then the probability of head appearing on the fifth toss equals, the probability of appearance of tail, prove?

| T | – 1 min |
| S | – Probability |

Ans.

47. If the frequency of first four numbers out of 1, 2, 4, 6, 8 are 2, 3, 3, 2 respectively, the frequency of 8 if their AM is 5 is

| T | – 1 min |
| S | – Arithmetic mean |

Ans.

Questions 48-50, From a set of 15 cards numbered 1, 2, _____ 15, one is drawn.

48. Probability that the number on the card is odd.

| T | – 3 min |
| S | – Probability |

Ans.

49. Probability that the number on the card is prime.

Ans.

50. Probability that the number is divisible by 5.

Ans.

Opening Window

To enlighten your regular knowledge of topic. If you score more than 55 marks here, you have achieved this level brilliantly. Move to the next level of test papers.

Section B (60 marks)   **Time given – 45 minutes + 5 minutes for revision**
Questions 51 to 80 carry 2 marks each.

For questions, 61–62.The marks obtained (out of 25) by 15 students in a monthly test are: 11, 09, 07, 03, 18,21, 13, 15, 18, 04, 06, 17, 22, 13, 15

51. Find the mean of their marks.

T	– 1 min
S	– Statistics and statistical data

Ans.

52. Find the mean of their marks when the marks of each student are increased by 2.

T	– 1 min
S	– Statistics and statistical data

Ans.

53. The number of goals scored by a football team in a series of matches are 3, 1, 0, 7, 5, 3, 3, 4, 1, 2, 0, 2. Find the median of this data.

T	– 1 min
S	– Statistics and statistical data

Ans.

54. What is the height of the tallest girl?

T – 1 min
S – Mean

Ans.

55. What is the height of the shortest girl?

T – 1 min
S – Mean

Ans.

56. What is the range of the data?

T – 1 min
S – Mean

Ans.

57. Find the mean height?

T – 1 min
S – Mean

Ans.

58. How many girls are there whose heights are less than the mean height.

T – 1 min
S – Mean

Ans.

59. A natural number is selected from 1 to 1000 at random, then the probability that a particular non-zero digit appears atmost once is

T	– 1 min
S	– Probability

Ans.

60. A card is drawn at random from a pack of 52 cards, the chance that it is either an ace or a heart is

T	– 1 min
S	– Probability

Ans.

61. A number is chosen at random from among the first 30 natural numbers. The probability of the number chosen being a prime is

T	– 1 min
S	– Probability

Ans.

62. There are 100 students in a college class of which 36 are boys studying statistics and 13 girls not studying statistics. If there are 55 girls in all, the probability that a boy picked up at random is not studying statistics is

T	– 1 min
S	– Probability

Ans.

63. The probability that a leap year selected at random contains 53 Sunday.

T	– 2 min
S	– Probability

Ans.

Questions 64-66, the rainfall (in mm) in a city on 7 days of a certain week were recorded as follows

Day	Mon.	Tue	Wed.	Thu.	Fri.	Sat.	Sun.
Rainfall in mm	2.2	21.3	25.6	0.0	4.9	0.0	5.5

64. Find the range of the rain fall?

T	– 3 min
S	– Statistics

Ans.

65. Find the mean rainfall for the week

Ans.

66. On how many days was the rainfall less than the mean rainfall?

Ans.

67. The mean of 25 observations is 27. If one observation is included, the mean still remain 27. Find the included observation?

T	– 2 min
S	– Statistics

Ans.

68. The mean of 5 numbers is 20. If one number is excluded, mean of the remaining numbers becomes 23. Find the excluded number.

| T | – 2 min |
| S | – Mean |

Ans.

69. The mean of 5 observations is 15. If mean of the first 3 observations is 14 and that of the last three is 17, find the third observation.

| T | – 2 min |
| S | – Statistics |

Ans.

Questions 70-71, A group of students was given a special test. The test was completed by the various students in the following time (in minutes) 17, 19, 20, 22, 24, 28, 30, 30, 36

70. Find the mean time taken by the students to complete the test?

| T | – 4 min |
| S | – Statistics |

Ans.

71. How many students took more than the mean time to complete the test?

Ans.

Questions 72-73, Given below are the seats won by different political parties in the polling outcome of a state assembly elections.

Political party	A	B	C	D	E	F
Seats won	75	55	37	29	10	37

72. Draw a bar graph to represent the polling results.

T – 4 min
S – Statistics and statistical data

Ans.

73. Which political party won the maximum number of seats.

Ans.

74. If the numbers 3, 6, 7, 10, x, 15, 19, 20, 25, 28, are in ascending order and their median is 13, calculate the value of x.

T – 2 min
S – Statistics and statistical data

Ans.

75. Using class interval 1-5, 6-10, 11-15, ---- construct the frequency distribution for the following data 13, 6, 12, 9, 11, 14, 2, 8, 18, 16, 9, 13, 17, 11, 19, 6, 7, 12, 22, 21, 18, 1, 8, 12, 18

T – 2 min
S – Statistics and statistical data

Ans.

Questions 76–78. The height of 240 students of a school are measured and tabulated as below :

Height (in cm)	below 100	below 110	below 120	below 130	Below 140	Below 150
No. of students	12	30	65	180	218	240

76. Construct a frequency distribution table for the above data.

T	– 6 min
S	– Statistics and statistical data

Ans.

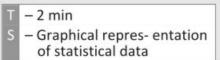77. How many students have atleast 1m height but less than 120cm height ?

Ans.

78. How many students have atleast 130cm height ?

Ans.

79. A man with a monthly salary of Rs 6400 plans his budget for a month as given below.

Item	Food	Clothing	Education	Miscellaneous	Savings
Amount (in Rs)	2100	600	1200	1500	1000

Represent the above data by a bar graph.

T	– 2 min
S	– Graphical repres- entation of statistical data

Ans.

80. Mean of 100 items is 49. It was discovered that three items which should have been 60, 70, 80, were wrongly read as 40, 20, 50, respectively. Find the correct mean.

T	– 2 min
S	– Statistics and statistical data

Ans.

To enlighten your regular knowledge of topic. If you score more than 50 marks here, you have achieved this level brilliantly. Move to the next level of test papers.

Section C (60 marks)   **Time given – 45 minutes + 5 minutes for revision**

81. The probability that the 13th day of a randomly chosen month is Friday?

T	– 2 min
S	– Probability

Ans. [   ]

82. Mean of 25 observations was found to be 78.4. But later on it was found that 96 was misread as 69. Find the correct mean.

T	– 2 min
S	– Probability

Ans. [   ]

83. In a class of 100 students here are 70 boys whose average marks in a subject are 75. If the average marks of the complete class is 72. Then what is the average of the girls?

T	– 2 min
S	– Average

Ans. [   ]

84. A bag contains 6 red and 3 white balls. Four balls are drawn one by one and not replaced the probability that they are alternatively of different colors.

T – 2 min
S – Probability

Ans.

85. The mean height of 15 students is 154 cm. It is discovered later on that while calculating the mean the reading 175 cm. was wrongly read as 145 cm. The correct mean height.

T – 2 min
S – Mean

Ans.

86. *A* and *B* play a game where each is asked to select a number from 1 to 25. If the two numbers match, both of them win a prize. The probability that they will not win a prize in a single trial is.

T – 2 min
S – Probability

Ans.

87. In a family, there are 8 men, 7 women and 5 children whose mean ages separately are respectively 24, 20 and 6 years. The mean age of the family.

T	– 2 min
S	– Mean

Ans.

88. The number of observations in a group is 40. If the average of first 10 is 4.5 and that of the remaining 30 is 3.5, then the average of the whole group is

T	– 2 min
S	– Average

Ans.

89. A class consist of 100 students, 25 of them are girls and 75 boys, 20 of them are rich and remaining poor, 40 of them are fair complexioned. The probability of selecting a fair complexioned rich girl is

T	– 2 min
S	– Probability

Ans.

90. Seven chits are numbered 1 to 7 four are drawn one by one with replacements. The probability that the least numbers on any selected shirt is 5, is

T – 2 min
S – Probability

Ans.

91. The height of 40 student in class IX A are measured in cm and obtained data is represented in the following table

Height (cm)	Number of students
118–127	2
127–136	5
136–145	4
145–154	9
154–163	12
163–172	5
172–181	3

Draw a histogram to represent the given data.

T – 2 min
S – Histogram

Ans.

92. For the given data 21, 25, 17, $(x+3)$, 19, $(x-4)$, 3 if the mean is 18, find the value of x?

Ans.

93. Out of 16 observations arranged in ascending order. The 8th and 9th observations are 25 and 25. What is the median?

Ans.

94. Find the median of first ten prime number

Ans.

95. Find the mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18.

Ans.

96. The height of 40 students in class IX A is measured in cm and obtained data is represented in the following table :

Height (cm)	118–127	127–136	136–145	145–154	154–163	163–172	172–181
Number of students	2	5	4	9	12	5	3

Draw a histogram to represent the given data.

T	– 3 min
S	– Graphical repres- entation of statistical data

Ans.

97. For the given data 21, 25, 17, $(x + 3)$, 19, $(x - 4)$, 3 if the mean is 18, find the value of x?

T	– 3 min
S	– Statistics and statistical data

Ans.

98. One dice is thrown 30 times and the outcome of each throw is given below.
2, 3, 4, 1, 2, 4, 5, 6, 4, 3, 6, 1, 5, 4, 2 4, 3, 5, 6, 1,
1, 6, 5, 6, 3, 5, 2, 2, 3, 2.
Represent the data in the form of frequency distribution table. Write the
mode of the distribution.

| T | – 3 min |
| S | – Statistics and statistical data |

Ans.

99. Mean of 25 observations was found to be 78.4. But later on it was found that
96 was misread as 69. Find the correct mean.

| T | – 3 min |
| S | – Statistics and statistical data |

Ans.

100. In a class of 100 students, there are 70 boys having average marks in a subject as 75. If the average marks of the complete class is 72. Then what is the average of the girls?

T	– 3 min
S	– Statistics and statistical data

Ans.

Tools at a glance

Opening Window with instructions for your potential analysis and guideline to improve your performance.

Opening Window

Let's Chat, the feature with suggestive topics for discussion so as to improve your capacity to debate on various topics.

T — ....
S — ....

Box with time break-up of questions **(T)** and its concept (**S**, i.e., subject)

Let's Chat

Brain Teasers

Brain Teasers i.e., Questions with difference to make the concepts of students crystal clear. These are the questions with higher difficulty levels to check the grip of the students over the concepts.

Extra Diet, the web link, the notation: www._____ to provide additional information regarding the concept for more clarity of thoughts.

Extra Diet

CBSE GRADING PATTERN

As the new pattern includes **CCE** (Continuous and Comprehensive Evaluation) which will be run in two terms i.e., from April to September and October to March. Thus the school will conduct four **Formative** and two **Summative** Assessments.

However, the most generalised version of grades is given below:

MARKS PERCENTAGE	GRADE	GRADE POINT	CATEGORY
91 to 100	A1	10	Exceptional
81 to 90	A2	9	Excellent
71 to 80	B1	8	Very Good
61 to 70	B2	7	Good
51 to 60	C1	6	Ordinary
41 to 50	C2	5	Average
33 to 40	D	4	Below Average
21 to 32	E1	3	Improvement Needed
Below 20	E2	Below 2	Unsatisfactory