Grade 09
Unit 11

Maths

Course Outline

Formative 4

- **Probability**
- **Statistics**
- **Surface areas and volumes**

MAT

(Monthly Achievement Tests)

Short Code: 447310

Test ID: NMM09U110

SOUVENIR INFOTECH

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 SOUVENIR INFOTECH **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.

50

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.

For each question, four options are 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. If a coin is tossed, probability of getting head is

(a) 1 (b) 0 (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

T – 1 min
S – Probability

Ans.

2. Area of the parallelogram

(a) a^2 (b) ah

(c) $\frac{1}{2}(a+b)h$ (d) $\frac{1}{2}bh$ Area $= \frac{1}{2}bh$

T – 1 min
S – Area

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

Ans.

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

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

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

T – 1 min
S – Statistics

Ans.

5. Volume of the cuboid is

(a) $l \times b \times h$ (b) $lb + bh$

(c) l^3 (d) $6l^2$

T – 1 min
S – Volume

Ans.

6. Bodies which have three dimensions in space are called

(a) volume (b) plane figure

(c) solid (d) surface area

T – 1 min
S – Volume

Ans.

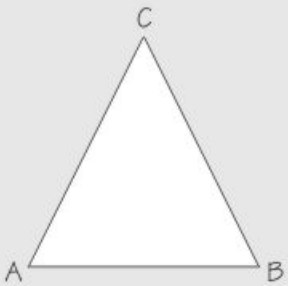
7. Perimeter of a triangle in ΔABC is

(a) AB

(b) $AB + BC$

(c) $AB + BC + CA$

(d) $BC + CA$.



T – 1 min
S – Surface area

Ans.

8. Probability of getting prime number on dice is

(a) 0 (b) 1

(c) $\frac{1}{3}$ (d) $\frac{1}{2}$

T – 1 min
S – Probability

Ans.

9. Probability of impossible event is

(a) 0 (b) 1

(c) $\frac{1}{2}$ (d) $\frac{2}{3}$

T – 1 min
S – Probability

Let's Chat

Discuss about Experimental approach of Probability

Ans.

10. Find the area of a triangle having sides 15 cm, 14 cm & 13 cm.

(a) 64 cm^2 (b) 80 cm^2

(c) 84 cm^2 (d) 70 cm^2

T – 1 min
S – Area

Ans.

11. A soap dish measures 6 cm × 3 cm × 2 cm. The volume of the packet containing 5 such soap dishes will be

(a) 360 cm^3 (b) 288 cm^3

(c) 280 cm^3 (d) 180 cm^3

T – 1 min
S – Volume

Ans.

12. Surface area of a box whose length is 40 cm, breadth 27 cm & height 10 cm is

(a) 2500 cm^2 (b) 3500 cm^2

(c) 1600 cm^2 (d) 1500 cm^2

T – 1 min
S – Surface area

Ans.

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

(a) 20 (b) 15

(c) 25 (d) 18

T – 1 min
S – Statistics

Ans.

14. 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

Ans.

15. The area of a triangle is 48 cm^2. Its base is 12 cm then the altitude is

(a) 4 cm (b) 6 cm

(c) 8 cm (d) 7 cm

T – 1 min
S – Area

Ans.

16. Area of a square that can be inscribed in a circle of radius r

(a) $3r^2$

(b) $4r^2$

(c) $\sqrt{3}r^2$

(d) $2r^2$

T – 1 min
S – Area

Ans.

17. The area of a square park is 40,000 m^2. The cost of fencing it at Rs. 2.80 per m^2

(a) Rs. 2240 (b) Rs. 1240

(c) Rs. 1124 (d) Rs. 1324

T – 1 min
S – Area

Ans.

18. Diagonal of a rectangle is

(a) $\sqrt{l^2 + b^2}$ (b) $2\sqrt{l^2 + b^2}$

(c) $\sqrt{2}\sqrt{l^2 + b^2}$ (d) $3\sqrt{l^2 + b^2}$

T – 1 min
S – Area

Ans.

19. Branch of mathematics which deals with measurement of length areas & volume of plane and solid figure is

(a) statistics (b) histogram

(c) mensuration (d) bar graph

T – 1 min
S – Mensuration

Ans.

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

(a) histogram (b) median

(c) statistics (d) mode

T – 1 min
S – Statistics

Ans.

Fill in the blanks

21. Area of an equilateral triangle, with each side a is _____ .

T – 1 min
S – Area

Ans.

22. The most frequently occurring observation is known as _____ .

T – 1 min
S – Statistics

Ans.

23. Upper class limit of the class interval 30-39 is_____ .

T – 1 min
S – Statistics

Ans.

24. Lateral surface area of a cuboid is _____ .

T – 1 min
S – Surface area

Ans.

25. Number of faces of the cuboid _____ .

T – 1 min
S – Surface area

Ans.

26. A _____ is an action which results in one or several outcomes.

T – 1 min
S – Probability

Ans.

27. Probability of getting no head is _____ .

T – 1 min
S – Probability

Ans.

28. Height of an equilateral triangle, with side a is _____ .

T – 1 min
S – Area

Ans.

29. Surface area of a cube is _____ .

T – 1 min
S – Surface area

Ans.

30. $l \times b \times h$ = _____ .

T – 1 min
S – Volume

Ans.

True or False

31. The area of top and bottom faces is called lateral surface area.

T – 1 min
S – Surface area

Ans.

32. Area of a triangle $= \sqrt{(s-a)(s-b)(s-c)}$ is called heron's formula.

T – 1 min
S – Heron's formula

Ans.

33. Area of a triangle $= \frac{1}{2} \times$ base $\times$ height

T – 1 min
S – Area

Ans.

34. The probability of an event lies between 0 and 1.

T – 1 min
S – Probability

Ans.

35. The median is the most frequently occurring observation

T – 1 min
S – Statistics

Ans.

36. Mean $\bar{x} = \frac{\sum_{1=1}^{n} xi}{n}$

T – 1 min
S – Statistics

Ans.

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

T – 1 min
S – Statistics

Ans.

38. Volume of a hemisphere is $\frac{1}{3}\pi r^3$.

T – 1 min
S – Volume

Ans.

39. The measure of the occupied space is called the volume of the object.

T – 1 min
S – Volume

Ans.

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

T – 1 min
S – Probability

Ans.

41. Probability of getting a diamonds card in a pack of 52 cards.

T	– 1 min
S	– Probability

Ans.

42. If the probability of winning a game is 0.4, then find the probability of loosing

T	– 1 min
S	– Probability

Ans.

43. A cuboidal vessel 1.5 m long & 6 m wide can hold 36 m^3. Find its height?

T	– 1 min
S	– Volume

Ans.

44. The volume of the right circular cylinder having height 21 cm and the base radius 5 cm $\left(\pi = \frac{22}{7}\right)$.

T	– 1 min
S	– Volume

Ans.

45. The total surface area of sphere is 3850 cm^2, then find the diameter of the sphere $\left(\pi = \frac{22}{7}\right)$.

T	– 1 min
S	– Volume

Ans.

46. The height & slant height of a cone are 21 cm and 28 cm. Find the volume of the cone?

T	– 1 min
S	– Volume

Ans.

47. Find the median of the following 20, 22, 25, 28, 30.

T	– 1 min
S	– Statistics

Ans.

48. Find the arithmetic mean of 20, 25 28, 30, 22.

T	– 1 min
S	– Statistics

Ans.

49. Find the mode of 2, 3, 4, 5, 5, 1, 3, 3, 4, 3

T	– 1 min
S	– Statistics

Ans.

50. Construct an angle of 60° at the initial point of a given ray.

T	– 1 min
S	– Construction

Ans.

30

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.

51. Surface area of a sphere is 5544 cm^2, then its radius will be

T – 1 min
S – Surface area

Ans.

52. The radius and vertical height of a cone are 5 cm & 12 cm respectively then its curved surface area will be

T – 1 min
S – Surface area

Ans.

Questions 53-55, using the given statement. From a set of 17 cards, numbered 1, 2... 17, one is drawn

53. Probability that the numbers on the card is prime.

T – 1 min
S – Probability

Ans.

54. Probability that the numbers on the card is odd.

T – 2 min
S – Probability

Ans.

55. Probability that the number on card is divisible by 3?

T – 2 min
S – Probability

Ans.

57. Find the side of a square whose area is 16200 m^2

T – 2 min
S – Area

Ans.

58. A rectangular plot is a 150 m^2 in area. Its length is 15 m, find its perimeter.

T – 2 min
S – Area

Ans.

59. Find the area of the parallelogram whose base is 32m & the corresponding altitude is 6 m.

T – 2 min
S – Area

Ans.

60. Find the area of a rhombus whose diagonals are 10 cm and 8 cm.

T – 2 min
S – Area

Ans.

T – 10 min
S – Surface area and volume of cube and cuboid

Match the following

61. Surface area of the cuboid — (i) $\frac{\sqrt{3}}{4}a^2$

62. Volume of the cube — (ii) $\frac{2}{3}\pi r^3$

63. Curved surface area of cone — (iii) $l \times b \times h$

64. Surface area of cube — (iv) a^3

65. Heron's formula — (v) $\pi r^2 h$

66. Volume of hemisphere — (vi) $6a^2$

67. Area of equilateral triangle — (vii) $\sqrt{s(s-a)(s-b)(s-c)}$

68. Volume of cylinder — (viii) πrl

69. Volume of cuboid — (ix) $3\pi r^2$

70. Total surface area of a hemisphere — (x) $2(lb + bh + hl)$

71. Write short notes on mean, median and mode?

Ans.

Questions 72-74, answer the following questions :

Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardised conditions favourable to germination after 20 days, the number of seeds which had germinated in each collection were counted and record as follows

Bag	1	2	3	4	5
Number of seeds germinated	40	48	42	39	41

72. What is the probability of germination of more than 40 seeds in a bag?

T – 2 min
S – Probability

Ans.

73. What is the probability of germination of 49 seeds in a bag?

T – 2 min
S – Probability

Ans.

74. What is the probability of germination of more that 35 seeds in a bag?

T – 2 min
S – Probability

Ans.

75. Find the area of a triangle, two sides of which are 8 cm and 11 cm and the perimeter is 32 cm?

T – 2 min
S – Area

Ans.

76. Sanya has a piece of land which is in the shape of a rhombus. She wants her one daughter and one son to work on the land and produce different crops. She divided the land in two equal parts. If the perimeter of the land is 400 m and one of the diagonals is 160 m, how much area each of them will get for their crops?

T – 2 min
S – Area

Ans.

77. Find the area of a parallelogram with base 32 cm and altitude 16.5 cm.

T – 2 min
S – Area

Ans.

Construct a triangle ABC in which

78. $BC = 7\text{cm}$, $\angle B = 75°$ and $AB + AC = 125$ cm

T – 2 min
S – Area

Ans.

79. $BC = 9.2$ cm, $\angle B = 45°$ and $AB - AC = 4.2$ cm.

T – 2 min
S – Surface area

Ans.

80. $\angle B = 30°$ and $\angle C = 90°$, $AB + BC + CA = 10$ cm

T – 2 min
S – Surface area

Ans.

20

Opening Window

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. If the area of an equilateral triangle is $36\sqrt{3}$ cm^2. Find its perimeter.

T – 2 min
S – Area

Ans.

82. Find the area of a triangle whose sides are 26 cm, 28 cm and 30 cm.

T – 2 min
S – Heron's formula

Ans.

83. One disc 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 a form of frequency distribution table. Write the mode of the distribution

T – 2 min
S – Statistics

Ans.

84. A shot-putt is a metallic sphere of radius 4.9 cm. If the density of the metal is 7.8 g per cm^3. Find the mass of the shot-putt.

T – 2 min
S – Volume

Ans.

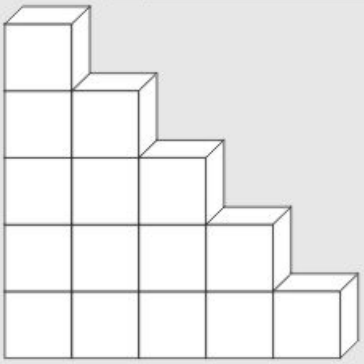
85. The pillars of bridge are cylindrically shaped. If each pillar has a circular base of radius 20 cm and height 10m, how much concrete mixture would be required to build 14 such pillars?

T – 2 min
S – Volume

Ans.

86. A child playing with building blocks, which are of the shape of cubes, has built a structure as shown in figure. If the edge of each cube is 3 cm, find the volume of the structure built by the child

T – 2 min
S – Volume



Ans.

87. A hemispherical dome of a building needs to be painted. If the circumference of the base of the dome is 17.6 m, find the cost of painting it, (given the cost of painting is Rs. 5 per 100 cm^2.)

T – 2 min
S – Surface area

Ans.

88. Find the median out of the temperature recorded on the first week of June 2002.
40.5, 42, 42, 43, 44, 45.2, 44.3

T – 2 min
S – Statistics

Ans.

Questions 89-90, answer the following questions:

89. From a well shuffled deck of 52 cards: Probability of on ace is equal to:

T – 2 min
S – Probability

Ans.

90. Probability of getting a number less than 5 in a single throw of a disc.

T – 2 min
S – Probability

Ans.

Answer Questions 91-92 after reading the sentence, "1000 tickets of a lottery were sold & there are 5 prizes on these tickets. If Shanti has purchased one lottery ticket."

91. Probability of winning a prize.

T – 2 min
S – Probability

Ans.

92. Probability of losing a prize.

T – 2 min
S – Probability

Ans.

93. A disc is thrown 1000 times with the frequencies for the outcomes 1, 2, 3, 4, 5 and 6 as given in the following table.

Outcome	1	2	3	4	5	6
Frequency	179	150	157	149	175	190

T – 3 min
S – Probability

Find the probability of getting each outcome

Let's Chat

Discuss about Measures of central Tendency.

Ans.

94. Find the volume of a sphere whose surface area is 154 cm^2.

T – 3 min
S – Surface area

Ans.

95. Find the volume of a sphere of radius 11.2 cm.

T – 3 min
S – Volume

Ans.

96. A match box measures 4 cm × 2.5 m × 1.5 cm. What will be the volume of a packet containing 10 such boxes?

T – 3 min
S – Volume

Ans.

Questions 97-98, find the following if the radius of the hemisphere is 21 cm.

97. The curved surface area

T	– 3 min
S	– Surface area

Ans.

98. The following table represents the number of literate females in a town :

Age group	10-15	15-20	20-25	25-30	30-35	35-40	Total
No. of females	300	980	800	580	290	50	3000

Draw a histogram to represent the above data.

T	– 3 min
S	– Statistics

Ans.

99. In a class of 100 students there are 70 boys whose average marks in a subject are 75. If the average marks of the complete class is 65. What is the average of the girls ?

T	– 3 min
S	– Statistics

Ans.

100. The number of observations in a group is 40. If the average of first 20 is 4.5 and that of remaining 20 is 3.5, find the average of the whole group.

T	– 3 min
S	– Statistics

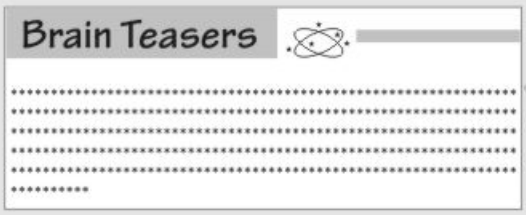
Ans.

Tools at a glance

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

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

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



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.

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 (Fair)
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