Grade 09
Unit 12

Maths

Course Outline

Summative-2

MAT

(Monthly Achievement Tests)

Short Code: 447310

Test ID: NMM09U120

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 questions 1 to 20 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. Out of these properties which property does not hold true in case of a parallelogram

(a) opposite sides are equal

(b) opposite angles are equal

(c) diagonals bisect each other

(d) each angle is 90°

T – 1 min
S – Quadrilaterals

Ans.

2. When P and Q are ends of a diameter then both arcs are known as

(a) minor arc (b) major arc

(c) semicircle (d) none of these

T – 1 min
S – Circle

Ans.

3. Probability of getting even number on dice is

(a) 0 (b) 1/2

(3) 1/3 (d) 2/3

T – 1 min
S – Probability

Ans.

4. Volume of the cylinder is

(a) $2\pi r^2 h$ (b) $\frac{2}{3}\pi r^2 h$

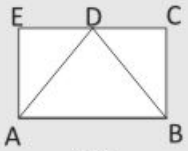
(c) $\frac{1}{3}\pi r^2 h$ (d) $\pi r^2 h$

T – 1 min
S – Volume of cylinder

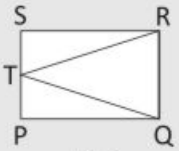
Ans.

5. Which of the given figures are not on the same base and between the same parallels.

T – 1 min
S – Area of parallelograms



(a)



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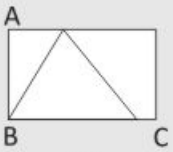
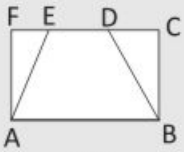


(c)



(d)

Ans.

6. Out of all the parallelograms on the base which has the greatest area

(a) rhombus (b) square

(c) rectangle (d) trapezium

T – 1 min
S – Area of parallelograms

Ans.

7. AD is one of the medians of a ΔABC and X is any point on AD area$(\Delta AB\times) =$

(a) area (ΔACX)

(b) $\frac{1}{2}$ area (ΔACX)

(c) $\frac{1}{3}$ area (ΔACX)

(d) $\frac{1}{4}$ area (ΔACX)

T – 1 min
S – Area

Ans.

8. Curved surface area of a hemisphere is

(a) $3\pi r^2$ (b) $2\pi r^2$

(c) πr^2 (d) $\pi r^2 h$

T – 1 min
S – Curved surface area

Ans.

9. Probability of an impossible event is

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

(c) 1 (d) 2/3

T – 1 min
S – Probability

Ans.

10. Properties of rectangle does not include
(a) diagonals bisect each other at 90°
(b) each angle is 90°
(c) pair of opposite sides are equal
(d) diagonal divides it into two congruence

T – 1 min
S – Quadrilateral

Ans.

11. Perimeter of a square is ..... that of an equivalent parallelogram on the same base
(a) less than (b) greater than
(c) equal to (d) cannot be determined

T – 1 min
S – Quadrilateral

Ans.

12. Find the value of K. So that $y = -1$ and $n = 1$ is the solution of $13n = ky + 25$
(a) -11 (b) -18
(c) 15 (d) 12

T – 1 min
S – Linear equation

Ans.

13. The graph $y = 5$ is a straight line _____ .
(a) parallel to y-axis
(b) perpendicular to x-axis
(c) parallel to x-axis
(d) none of these

T – 1 min
S – Linear equation

Ans.

14. If n is an even number, then the median is
(a) $\frac{n}{2}$th observation
(b) $\left(\frac{n+1}{2}\right)$th observation
(c) $\frac{n}{2} + 1$th observation
(d) $\left(\frac{n}{2}\right)$th and $\left(\frac{n}{2} + 1\right)$th observation

T – 1 min
S – Linear equation

Ans.

15. Upper class limits of the class interval 30–39 is
(a) 30 (b) 34
(c) 39 (d) 35

T – 1 min
S – Statistics

Ans.

16. If the arithmetic mean of 6, 10, n, 12 is 8. Then the value of n is

(a) 2 (b) 4

(c) 6 (d) 10

T – 1 min
S – Statistics

Ans.

17. Total surface area of the hemisphere is

(a) $2\pi rh$ (b) $2\pi r^2$

(c) $3\pi r^2$ (d) $4\pi r^2$

T – 1 min
S – Statistics

Ans.

18. Class size of the class interval $5 - 15$ is

(a) 5 (b) 15

(c) 10 (d) cannot be determined

T – 1 min
S – Statistics and Statistical data

Ans.

19. Mean of first 8 natural numbers is

(a) 2.5 (b) 6

(c) 3.5 (d) 4.5

T – 1 min
S – Statistics and Statistical data

Ans.

20. If the diagonal of a rectangle bisects the opposite angles then the rectangle is a

(a) rhombus

(b) trapezium

(c) square

(d) kite

T – 1 min
S – Statistics and Statistical data

Ans.

Fill in the blanks

21. $ax + by + c = 0$ is called _____ .

T – 1 min
S – Liner equations

Ans.

22. A figure formed by joining four points in an order is called a parallelogram.

T – 1 min
S – Quadrilateral

Ans.

23. The decimal expansion of rational numbers are terminating and _____.

T – 1 min
S – Number systems

Ans.

24. The solid obtained by rotating the right triangle *ABC* about the string is _____ .

T – 1 min
S – Surface areas and volume

Ans.

25. _____ is the middle most observation .

T – 1 min
S – Statistics

Ans.

26. Parallelogram and rectangle have the same base and also have equal areas, then the perimeter of the parallelogram is _____ than that of the rectangle.

T – 1 min
S – Area of parallelograms

Ans.

27. The set of all points in space which are equidistant from a fixed point is called a _____ .

T – 1 min
S – Sphere

Ans.

28. Volume of the cuboid is length × breadth × height

T – 1 min
S – Volume

Ans.

29. _____ in the same segment of a circle are equal.

T – 1 min
S – Circle

Ans.

30. _____ is the middle most observation .

T – 1 min
S – Statistics and Statistical data

Ans.

True or False

31. A figure formed by joining four points in an order is called a parallelogram.

T – 1 min
S – Quadrilateral

Ans.

32. Two figures are called congruent, if they have the same shape and the same size

T – 1 min
S – Areas of parallelograms and triangles

Ans.

33. Diameter is the longest chord of a circle

T – 1 min
S – Circle

Ans.

34. A circle has only finite number of chords.

T – 1 min
S – Circle

Ans.

35. Chords equidistant from the centre of a circle are equal in length

T – 1 min
S – Circle

Ans.

36. The difference of two solid concentric spheres is called a spherical shell

T – 1 min
S – Surface area and volume

Ans.

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

T – 1 min
S – Statistics

Ans.

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

T – 1 min
S – Probability

Ans.

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

T – 1 min
S – Statistics

Ans.

40. Volume of hemisphere is half of the volume of sphere

T – 1 min
S – Sphere

Ans.

Simple Questions

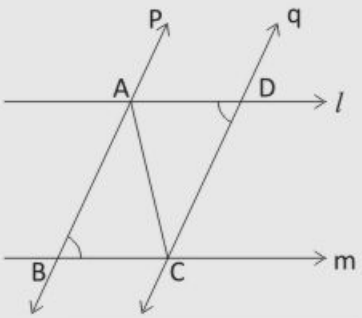
41. Find the products : $\left(x-\frac{y}{5}-1\right)\left(x+\frac{y}{5}+1\right)$.

T	– 1 min
S	– Algebraic identity

Ans.

42. *l* and *m* are two parallel lines intersect by another pair of parallel lines p and q as shown in fig. Show that $\Delta ABC \cong \Delta CDA$.

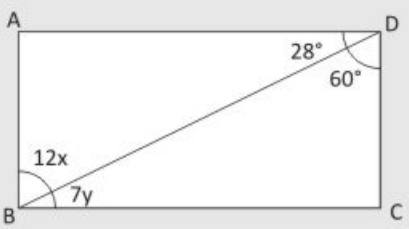
T	– 1 min
S	– Lines and angles



Ans.

43. *ABCD* is a parallelogram. Compute the values of *x* and y.

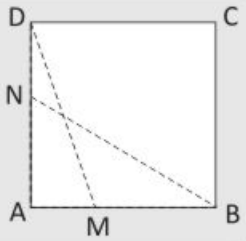
T	– 1 min
S	– Parallelogram



Ans.

44. In parallelogram *ABCD*, $AB = 10$ cm. The altitude corresponding to the side *AB* and *AD* are respectively 7 cm and 8 cm. Find *AD*.

T	– 1 min
S	– Parallelogram



Ans.

45. Diameter is the longest chord and all diameters have different length.

T	– 1 min
S	– Circle

Ans.

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

T	– 1 min
S	– Statistics and Statistical data

Ans.

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

T	– 1 min
S	– Statistics and Statistical data

Ans.

48. Find the arithmetic mean of squares of first five natural numbers.

T	– 1 min
S	– Statistics and Statistical data

Ans.

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

T	– 1 min
S	– Statistics and Statistical data

Ans.

50. Find the median of the data 19, 20, 25, 30, 35.

T	– 1 min
S	– Statistics and Statistical data

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.

Questions for 51-53 Write each of the following equations in the form $ax + by + c = 0$ and indicate the value of a, b and c in each case.

51. $3x + 7y = 2.437$

T – 3 min
S – Linear equation in two variables

Ans.

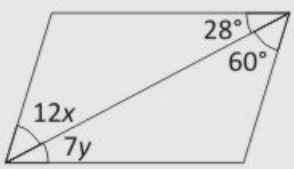
52. $x = y + 5$

Ans.

53. $4 = 7x - 5y$

Ans.

54. In figure *ABCD* is a parallelogram compute the value of *x* and *y*



T – 1 min
S – Quadrilateral

Ans.

55. In a parallelogram *ABCD*, prove that sum of any two consecutive angle is 180°.

T	– 1 min
S	– Quadrilateral

Ans.

56. In a parallelogram *ABCD*, $\angle D = 115°$, determine the measure of $\angle A$ and $\angle B$.

T	– 1 min
S	– Quadrilateral

Ans.

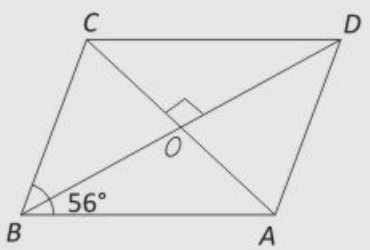
57. Prove that each of the four sides of a rhombus is of the same length.

T	– 1 min
S	– Quadrilateral

Ans.

58. *ABCD* is a rhombus with $\angle ABC = 56°$ Determine $\angle ACD$.

T	– 1 min
S	– Quadrilateral



Ans.

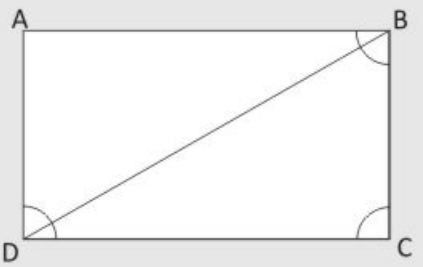
59. $ABCD$ is parallelogram P is a point on AD such that $AP = \frac{1}{3} AD$ and Q is a point on BC such that $CQ = \frac{1}{3} BC$. Prove that $AQCP$ is a parallelogram

T	– 1 min
S	– Quadrilateral

Ans.

60. In figure, find the four angle A, B, C and D in the parallelogram $ABCD$.

T	– 1 min
S	– Quadrilateral



Ans.

61. Draw the graphs of each of the following linear equation $x - 2 = 0$

x	2	2	2	2
y	0	1	5	–3

T	– 1 min
S	– Graph

Ans.

62. A conical paper cup is in the form of a right circular cone with height 8 cm and diameter of the base 4 cm. How much water can it hold?

T	– 1 min
S	– Volume of cone

Ans.

63. Find the volume of a right circular cylinder, if the radius 3.5 cm and $h = 2$cm

T	– 1 min
S	– Volume of cylinder

Ans.

64. The percentage of marks obtained by a student in the monthly unit tests are given below

Unit test	I	II	III	IV	V
% of marks obtained	69	71	73	68	74

Find the probability that the students gets more than 70% marks in a unit test.

T	– 1 min
S	– Probability

Ans.

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

T	– 1 min
S	– Sphere

Ans.

66. Find the arithmetic mean of squares of first 4 natural numbers?

T	– 2 min
S	– Mean

Ans.

67. The number 2, 3, 4, 4, $x + 3$, 5, 5, 6, 7 have been put in ascending order. If the median is 5. Then find x.

T	– 2 min
S	– Median

Ans.

68. Find the volume of a cube whose side is 4.2 cm

T	– 2 min
S	– Volume of cube

Ans.

69. Find the slant height of the cone whose height is 4 cm and radius 3 cm.

T	– 2 min
S	– Slant height of cone

Ans.

70. Two chords *AB* and *CD* of a circle are parallel and a line *l* is the perpendicular bisector of *AB*. Show that *l* bisects *CD*.

T	– 2 min
S	– Circle

Ans.

71. Find the curved surface area of a cone is 264 cm^2 and its slant height is 12 cm. Find (i) the radius of the base (ii) total surface area.

T	– 2 min
S	– Curved surface area of cone

Ans.

72. In the figure, *AB* is a diameter of the circle, *CD* is a chord equal to the radius of the circle. *AC* and *BD* when extended intersect at a point *E*. Prove that $\angle AEB = 60^\circ$

T	– 2 min
S	– Circle

Ans.

Questions 73-75, A tyre manufacturing company kept a record of the distance covered before a tyre need to be replaced. The table shows the results of 1000 cases.

Distance (in km)	less than 4000	4000–9000	9001–14000	more than 14000
frequency	20	210	325	445

If you buy a tyre of this company?

73. Which is the probability that it will need to be replaced before it has covered 4000 km?

T – 6 min
S – Probability

Ans.

74. What is the probability that it will last more than 9000 km?

Ans.

75. What is the probability that it will need to be replaced after it has covered somewhere between 4000 km and 14000 km?

Ans.

Questions 76-77, 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

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

T – 4 min
S – Statistics

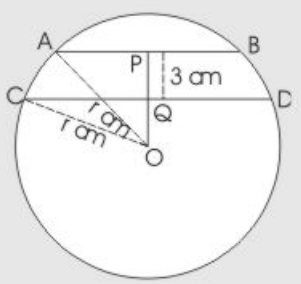
Ans.

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

Ans.

78. AB and CD are two chords of a circle such that $AB = 6$cm, $CD = 12$cm and $AB \parallel CD$. If the distance between AB and CD is 3 cm, find the radius of the circle.

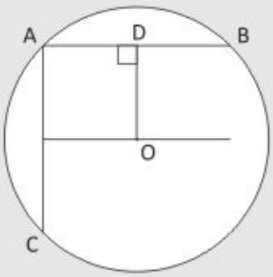
T – 2 min
S – Circle



Ans.

79. In the given figure, OD is perpendicular to the chord AB of a circle whose centre is O. If BC is a diameter, show that $CA = 2OD$.

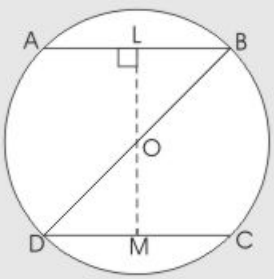
T	– 2 min
S	– Circle



Ans.

80. AB and CD are two parallel chords of a circle whose diameter is AC. Prove that $AB = CD$.

T	– 2 min
S	– Circle



Ans.

20 Thinking Ability Questions

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. Draw a graph of $y = x$ and $y = -x$ in the same graph also, find the coordinates of the point where the two lines intersect.

T – 2 min
S – Linear equation

Ans.

Questions 82-85, The percentage of marks obtained by a student in the monthly unit tests are given below.

Unit Test	I	II	III	IV	V
Percentage of Marks Obtained	58	68	76	62	85

82. Find the probability that the students get a first class *i.e.*, at least 60% marks.

T – 8 min
S – Statistics

Ans.

83. Find the probability that the students gets marks between 70% and 80%.

Ans.

84. Find the probability that a distinction must be seen on student's part *i.e.*, 75% or above

Ans.

85. Find the probability that the student gets less than 65% marks.

Ans.

86. Write the difference between deterministic experiment and random experiment.

T – 2 min
S – Statistics

Ans.

87. If the mean of 6, 4, 7, p and 10 is 8. Find the value of p

T	– 2 min
S	– Statistics

Ans.

88. A largest sphere is curved out of a cube of side 7 cm. Find the volume of the sphere.

T	– 2 min
S	– Volume of sphere

Ans.

89. The volume of the two spheres are in the ratio 64 : 27. Find the difference of their surface areas, if the sum of their radii is 7.

T	– 2 min
S	– Volume of sphere

Ans.

90. The volume of a cone is 18480 cm^2. If the height of the cone is 40 cm. Find the radius of its base.

T	– 2 min
S	– Volume of cone

Ans.

91. The lateral surface of a cylinder is equal to the curved surface of a cone. If the radius be the same. Find the ratio of the height of the cylinder and slant height of the cone.

T	– 2 min
S	– Surface area and volume

Ans.

92. The thickness of a hollow cylinder is 2 cm. It is 35 cm long and its inner radius is 12 cm. Find the volume of the wood required to make the cylinder, assuming it is open at either end.

T	– 2 min
S	– Volume of cylinder

Ans.

93. The area of the base of right circular cylinder is 154 cm^2 and its height is 15 cm. Find the volume of the cylinder.

T	– 2 min
S	– Volume of cylinder

Ans.

94. Water in a canal, 30 dm wide and 12 dm deep, is flowing with a velocity of 20 km per hour. How much area will it irrigate in 30 min, if 9 cm of standing water is desired.

T	– 2 min
S	– Volume of cylinder

Ans.

95. A cube of 9 cm edge is immersed completely in a rectangular vessel containing water. If the dimensions of the base are 15 cm and 12 cm. Find the rise in water level in the vessel.

T	– 2 min
S	– Volume of cuboid

Ans.

96. A class room is 7 m long, 6.5 m wide and 4 m high. It has one door3 m × 1.4 m and three window each measuring 2m × 1m. The interior wall are to be colour washed. The contractor charges Rs 5.25 per sq. m. Find the cost of colour washing.

T – 3 min
S – Volume of cuboid

Ans.

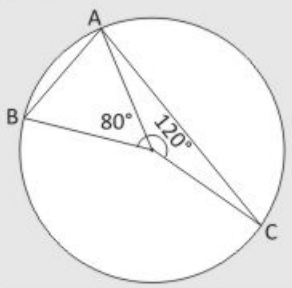
97. The sum of length, breadth, and depth of a cuboid is 19 cm and the length of its diagonal is 11 cm. Find the surface area of the cuboid.

T – 3 min
S – Cuboid

Ans.

98. Find $\angle BAC$ in the figure.

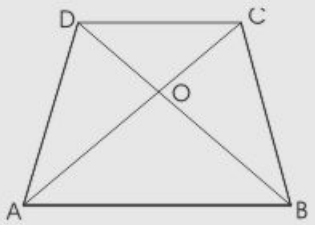
T – 3 min
S – Circle



Ans.

99. Diagonals AC and BD of a trapezium $ABCD$ with $AB \| DC$ intersect each other at O as shown. Prove that ar $(\Delta AOD) = ar(\Delta BOC)$.

T	– 3 min
S	– Trapezium



Ans.

100. The frequency distribution of weights (in kg) of 40 persons of a locality is given below

Weights (in kg)	40–45	45–50	50–55	55–60	60–65
frequency	4	12	13	6	5

Draw the histogram

T	– 3 min
S	– Statistic

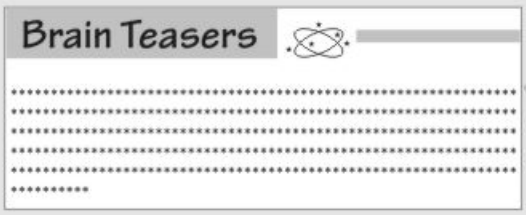
Ans.

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
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