Grade 09
Unit 03

Maths

Course Outline

Formative 1

- Number system
- Coordinate geometry
- Euclid's geometry
- Lines and angles
- Polynomials

MAT
(Monthly Achievement Tests)

Short Code: 447310

Test ID: NMM09U030

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. Find the angle whose complement is itself

(a) 90° (b) 180°

(c) 70° (d) 45°

T – 1 min
S – Lines and angles

Ans.

2. Reflex angle of 105° is

(a) 75° (b) 45°

(c) 165° (d) 255°

T – 1 min
S – Lines and angles

Ans.

3. The given two distinct points, then how many lines can pass through them?

(a) No (b) One

(c) Two (d) Infinite

T – 1 min
S – Euclid's geometry

Ans.

4. The number of points that a line can have

(a) infinite (b) three

(c) two (d) one

T – 1 min
S – Euclid's geometry

Ans.

5. Line segment is denoted by _____, if AB is a line segment.

(a) $\overline{AB}$ (b) $\overrightarrow{AB}$

(c) $\overleftrightarrow{AB}$ (d) $A\overline{B}$

T – 1 min
S – Lines and angles

Ans.

6. The sum of complementary angle is

(a) 90° (b) 270°
(c) 180° (d) 360°

T – 1 min
S – Lines and angles

Ans.

7. If a ray stands on a line, then the sum of two adjacent angles so formed is

(a) 90° (b) 180°
(c) 270° (d) 360°

T – 1 min
S – Lines and angles

Ans.

8. If $a - c = b - c$, then

(a) $a = c$ (b) $b = c$
(c) $a - c = c$ (d) $a = b$

T – 1 min
S – Euclid's geometry

Ans.

9. Number of points that two distinct lines can have

(a) infinite (b) three
(c) two (d) one

T – 1 min
S – Euclid's geometry

Ans.

10. The number of lines that can be drawn from a point

(a) one (b) two
(c) infinite (d) no

T – 1 min
S – Lines and angles

Ans.

11. If three or more points does not lie on the same straight line these are called.

(a) non-congruent
(b) Straight line
(c) collinear points
(d) non-collinear points

T – 1 min
S – Lines and angles

Ans.

12. If a transversal intervals a pair of lines in such a way that the sum of interior angles on the same side of transversal is 1280°, then the lines are

(a) perpendicular
(b) intersecting
(c) parallel
(b) none of the above

T – 1 min
S – Lines and angles

Ans.

13. If the linear pair of the angles are in the ratio of 5 : 7 then the angles are

(a) 65° and 115° (b) 115° and 65°

(c) 105° and 75° (b) 75° and 105°

T – 1 min
S – Lines and angles

Ans.

14. Divide $9\sqrt{24}$ by $3\sqrt{6}$

(a) 3 (b) 6

(c) 9 (b) 4

T – 1 min
S – Number system

Ans.

15. $.3\sqrt{18} \times 3\sqrt{2}$

(a) 24 (b) 84

(c) 42 (b) 54

T – 1 min
S – Number system

Ans.

16. Sum of consecutive interior angles is

(a) 90° (b) 270°

(c) 360° (b) 180°

T – 1 min
S – Lines and angles

Ans.

17. A number '*r*' is denoted as a _____ .

T – 1 min
S – Number system

Ans.

18. Which of them is not a polynomial ?

(a) $3x^2 + 2x + x^4 + 7$

(b) $x^2 + y^2 + 2x + 4$

(c) $x^2 + x + 1$

(d) none of the above

T – 1 min
S – Polynomials

Ans.

19. Find the zero of the polynomial $p(x) = x + 5$

(a) 5 (b) 0

(c) 3 (d) none of these

T – 1 min
S – Polynomials

Ans.

20. Find the quotient and remainder. Divide $x + 3x^2 - 1$ by $1 + x$.

(a) $3x - 2, x + 1$ (b) $3x + 2, 1$

(c) $3x - 2, 1$ (d) $8x + 2, x + 1$

T – 1 min
S – Polynomials

Ans.

Fill in the blanks

21. General statements, which are taken for granted without proof are called _____.

T – 1 min
S – Euclid's geometry

Ans.

22. Two segments are said to be congruent if they have same _____ .

T – 1 min
S – Euclid's geometry

Ans.

23. If two geometric figures are of same shape & size then they are said to be _____ .

T – 1 min
S – Euclid's geometry

Ans.

24. Line segment is a part of line with _____ .

T – 1 min
S – Euclid's geometry

Ans.

25. Vertically opposite angles are _____ .

T – 1 min
S – Lines and angles

Ans.

26. $y^2 + y + 7$ is _____ polynomial.

T – 1 min
S – Polynomials

Ans.

27. $(\sqrt[n]{a})^m =$ _____ .

T – 1 min
S – Number systems

Ans.

28. If two angles have a common vertex and common arm and non-common arms are different sides of a common arm then the angles are said to be _____ .

T – 1 min
S – Lines and angles

Ans.

29. The graph of every linear equation in two variables is a _____ .

T – 1 min
S – Lines and angles

Ans.

30. Coefficient of x^3 in $6x^3 + 5x^2 + 3x + 2$ is _____ .

T – 1 min
S – Lines and angles

Ans.

True or False

31. Angles forming a linear pair can both be acute angle.

T – 1 min
S – Lines and angles

Ans.

32. A line separates a plane into 3 parts.

T – 1 min
S – Euclid's geometry

Ans.

33. Say $\overrightarrow{AB}$ = say $\overrightarrow{BA}$ is true always

T – 1 min
S – Lines and angles

Ans.

34. Axioms related to geometry are known as postulates.

T – 1 min
S – Euclid's geometry

Ans.

35. Two intersecting lines cannot parallel to the same line.

T – 1 min
S – Euclid's geometry

Ans.

36. A number 5 is called irrational number, if it cannot be written in the form $\frac{p}{q}$.

T – 1 min
S – Number systems

Ans.

37. If two lines intersect each other, then the vertically opposite angles are equals.

T – 1 min
S – Lines and angles

Ans.

38. If a side of a triangle is produced, then the exterior angle so formed is equal to the sum of the two interior opposite angles.

T – 1 min
S – Lines and angles

Ans.

39. If the sum of two adjacent angles is 180°, then the non-common arms of the angles form line.

T – 1 min
S – Lines and angles

Ans.

40. If a line is perpendicular to one of the two given parallel lines then it is perpendicular to other lines.

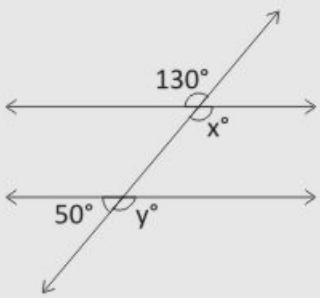
T – 1 min
S – Lines and angles

Ans.

Simple Question

41. Find the value of x and y.

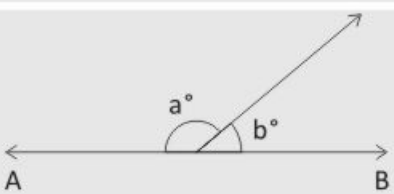
T – 1 min
S – Lines and angles



Ans.

42. If $a - 3b = 20°$ find a & b.

T – 1 min
S – Lines and angles



Ans.

43. Simplify $2^3 \cdot 2^4$

T – 1 min
S – Exponents

Ans.

44. Rationalise the denominator $\frac{1}{\sqrt{6}-\sqrt{5}}$

T – 1 min
S – Irrational numbers

Ans.

45. Expand $(x+2y+3z)^2$

T – 1 min
S – Polynomials

Ans.

46. Apply the identity $(x+a)(x+b) = x^2 + (a+b)x + ab$ and solve the following:

$(x+4)(x-15)$

T – 1 min
S – Polynomials

Ans.

47. $(x+6)(x+5)$

T – 1 min
S – Polynomials

Ans.

48. Find the remainder when $h(x) = x^3 - 6x^2 + 2x - 4$ is divided by $g(x) = 1 - 2x$ using remainder theorem.

T – 1 min
S – Polynomials

Ans.

49. Find the value of a if $(x+a)$ is a factor of the polynomial $x^3 + ax^2 - 2x + a + 4$

T – 1 min
S – Polynomials

Ans.

50. In the equation $7x - 3y = 12$, the co-ordinate of the point where the graph cuts the y –axis.

T – 1 min
S – Co-ordinate geometry

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. A portion of a line with end points is called

T – 1 min
S – Lines and angles

Ans.

52. In a parallelogram *PQRS* if $\angle P = 60^\circ$ then find $\angle Q$, $\angle R$ & $\angle S$.

T – 1 min
S – Lines and angles

Ans.

53. Euclidean geometry is a geometry dealing with _____.

T – 1 min
S – Euclid's geometry

Ans.

54. A figure formed by straight lines only, is called _____.

T – 1 min
S – Lines and angles

Ans.

55. What is a geometrical figure?

T – 1 min
S – Euclid's geometry

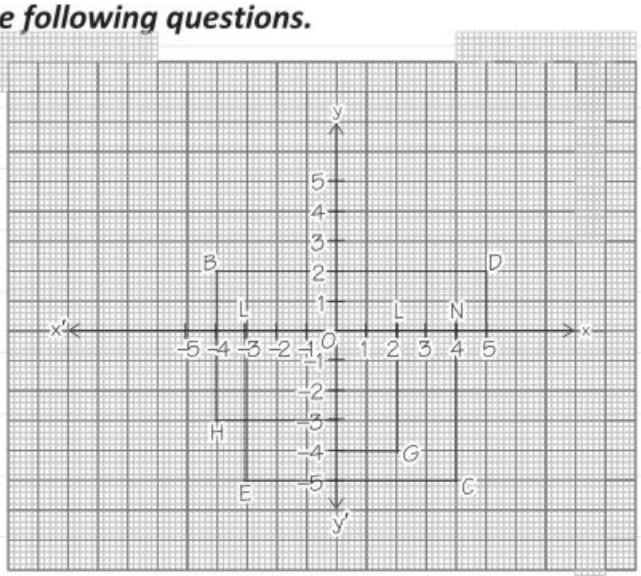
Ans.

56. Factorion $mm^2 - 5y + 6$

T – 1 min
S – Polynomials

Ans.

Questions 57-61, answer the following questions.



57. The co-ordinates of *B*.

T – 5 min
S – Euclid's geometry

Ans.

58. The abscissa of the point *D*.

Ans.

59. The ordinate of the point *H*.

Ans.

60. The co-ordinates of the point *L*.

Ans.

61. The co-ordinates of the point *D*.

Ans.

Questions 62-64, rationalise the following denominators

62. $\dfrac{1}{\sqrt{3}+2}$

T – 6 min
S – Rational numbers

Ans.

63. $\frac{1}{(\sqrt{2}-1)}$

Ans.

64. $\frac{1}{\sqrt{2}-\sqrt{1}}$

Ans.

65. Is zero a rational number ? Explain

T – 1 min
S – Rational numbers

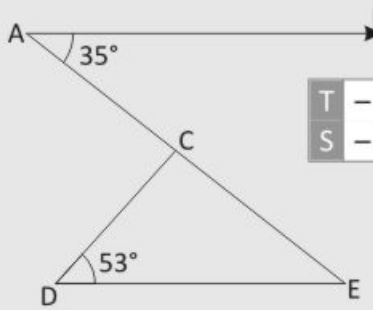
Ans.

66. Is $\frac{1}{0}$ a rational number.

T – 1 min
S – Rational numbers

Ans.

67. In the figure of $AB \| DE$, $\angle BAC = 35°$ and $\angle CDE = 53°$ find $\angle DCE$?



T – 2 min
S – Lines and angles

Ans.

Questions 68-71, Find the value of the polynomial $12x^2 - 7x + 1$, when

68. $x = 0$

T – 4 min
S – Polynomials

Ans.

69. $x = 2$

Ans.

70. $x = -1$

Ans.

71. $x = \frac{1}{2}$

Ans.

72. Solve $2^{-7/2} \times 2^{8/3} \times 2^{5/9}$.

T	– 4 min
S	– Polynomials

Ans.

73. Find the remainder when $x^3 + 3x^2 + 3x + 1$ is divided by $x - \frac{1}{2} = 0$

T	– 1 min
S	– Polynomials

Ans.

Questions 74-75, use the identity $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$ and solve the following:

74. $64m^3 - 343n^3$

T	– 6 min
S	– Polynomials

Ans.

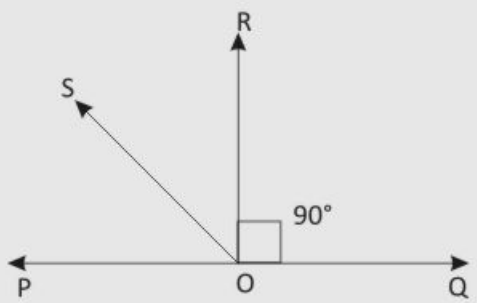
75. $8y^3 - 216z^3$

Ans.

76. In figure *POQ* is a line ray *OR* is perpendicular to live *PQ*. *OS* is another ray lying between rays *OP* and *OR* prove that

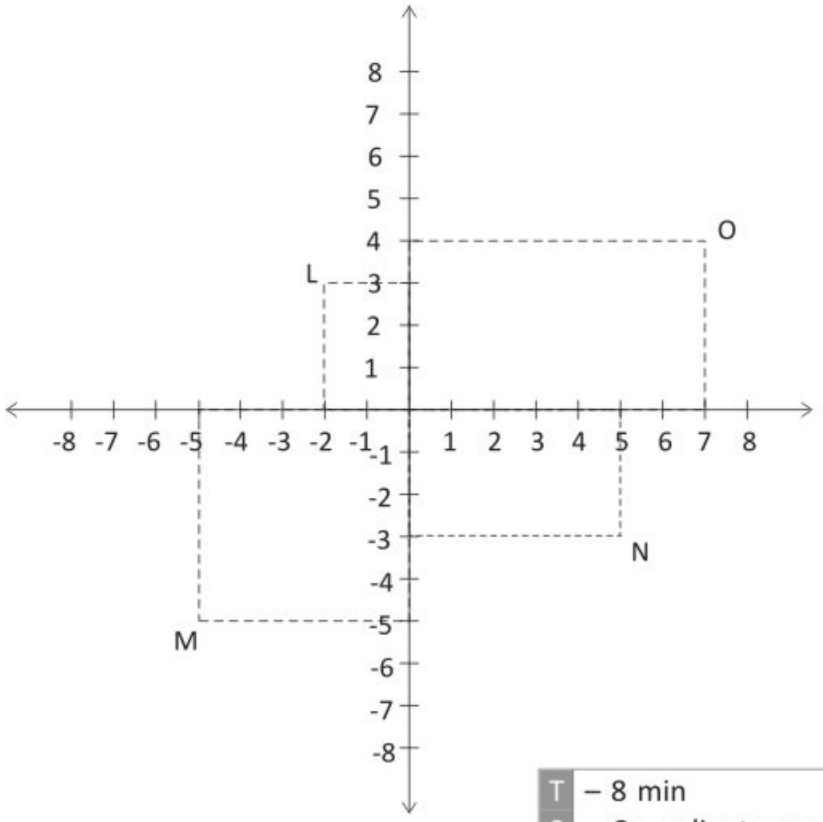
$$\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$$

T – 2 min
S – Lines and angles



Ans.

The questions 77-80, For answering, use the given diagram:



T – 8 min
S – Co-ordinate geometry

77. Find the abscissa of *M*?

Ans.

78. Find the co-ordinate of *N*?

Ans.

79. Find the ordinate of O?

Ans.

80. Find the quadrant of L?

Ans.

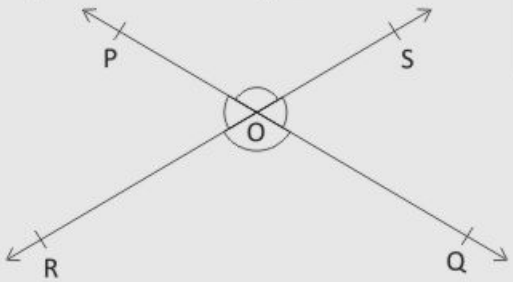
20 Thinking Ability Questions

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. In the figure lines PQ and RS. intersect each other at point O.
If $\angle POR : \angle ROQ = 5:7$, find all the angles.



T – 2 min
S – Lines and angles

Ans.

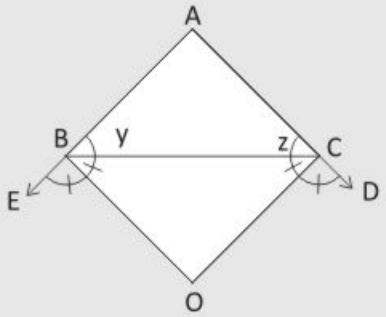
82. If A, B, C are three points on a line and B lies between A and C then prove that $AB + BC = AC$.

T – 2 min
S – Lines and angles

Ans.

83. In the figure the side AB and AC of ΔABC are produced to points E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at point O, then prove that $\angle BOC = 90° - \frac{1}{2}\angle BAC$.

T – 2 min
S – Lines and angles



Ans.

Questions 84-86, Simplify the following.

T – 6 min
S – Number system

84. $(\sqrt{5} + \sqrt{7})^2$

Ans.

85. $(\sqrt{3} + \sqrt{5})(\sqrt{3} - \sqrt{5})$

Ans.

86. $(3+\sqrt{2})(3-\sqrt{2})$

Ans.

87. Add $2\sqrt{2}+5\sqrt{3}$ and $\sqrt{2}-\sqrt{3}$

T – 2 min
S – Number system

Ans.

88. Multiply $3\sqrt{5}$ by $2\sqrt{5}$

T – 2 min
S – Number system

Ans.

89. Factorise the following
$27x^3+y^3+y^3+z^3-9xyz$

T – 2 min
S – Polynomials

Ans.

90. If $f(x)=x^3+4x^2-3x+10$ and $g(x)=x+4$ using remainder theorem, find the remainder when $f(x)$ is divided by $g(x)$.

T – 2 min
S – Polynomials

Ans.

91. Solve $(x+1)^3 + (x-1)^3$.

T	– 2 min
S	– Polynomials

Ans.

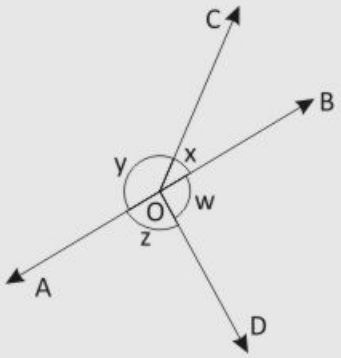
92. Find the quotient. Divide $x^3 + 13x^2 + 31x - 45$ by $x + 9$.

T	– 2 min
S	– Polynomials

Ans.

93. In figure if $x + y = w + z$, then prove that AOB is a line

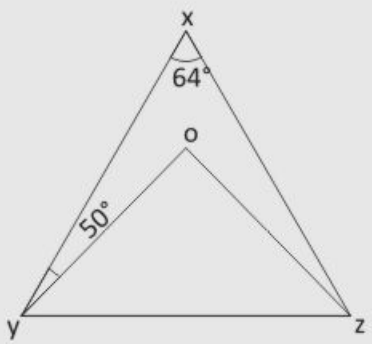
T – 2 min
S – Lines and angles



Ans.

94. In the figure $\angle x = 64°$, $\angle xyz = 50°$. If yo and zo are the bisector of $\angle xyz$ and $\angle xzy$ respectively of Δxyz find $\angle ozy$ and $\angle yoz$.

T – 2 min
S – Lines and angles



Ans.

95. Find the remainder when $P(x) = x^3 - 6x^2 + 2x - 3$ when it is divided by $3x - 1$.

T	– 2 min
S	– Polynomials

Ans.

Questions 96-98, Use suitable identities to find the following products

96. $(x + 8)(x + 6)$

T	– 2 min
S	– Polynomials

Ans.

97. $\left(x^2 - \frac{5}{2}\right)\left(x^2 + \frac{5}{2}\right)$

Ans.

98. Factorise : $2y^3 + y^2 - 2y - 1$

T – 2 min
S – Polynomials

Ans.

99. using remainder theorem find the remainder of the following:
x^3-3x^2-9x-5, divided by $x+3$.

T	– 3 min
S	– Polynomials

Ans.

100. Expand the following using suitable identities :
$(x+2y+4z)^2$

T	– 3 min
S	– Polynomials

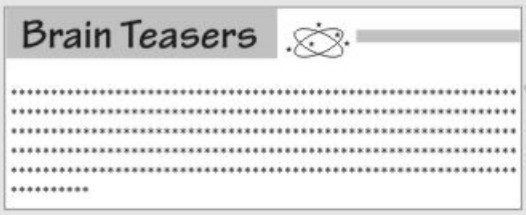
Ans.

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