Guidelines for the preparation of MATHEMATICS Question Papers for 9th and 10th Classes

❖ In Mathematics 80 marks were allotted for Summative Assessment Question paper.
❖ In Summative Assessment Question paper there will be Two parts, i.e. Part-A; and Part-B.
❖ Part-A and Part-B contains different types of questions as shown below:

	Types of Questions	Number of questions	Questions to be answered	Marks for each question	Total Marks	Allotted Time
Part-A	Very Short Answer Question	6	6	02	12	**TWO HOURS THIRTY MINUTES** **2 hr. 30 Min.**
	Short Answer Question	6	6	04	24	
	Essay type Questions	6	4	06	24	
Part-B	Multiple Choice Questions [MCQ]	20	20	01	20	**30 Minutes**
	TOTAL	**18+20MCQ**	**16+20MCQ**	**-**	**80 Marks**	**3 hours**

Important Note:

❖ Prepare question paper for 80 marks.
❖ The total marks allotted for Part-A is **60**.
❖ The allotted time for Part-A is **TWO HOURS THIRTY MINUTES**
❖ The total marks allotted for Part-B is **20**.
❖ The allotted time for Part-B is **Thirty Minutes**
❖ Question paper should be prepared based on the **Academic Standards**

❖ The Academic Standards weightage is shown in the following table:

S. No.	Academic Standards.	Percentage	Marks	VSAQ	SAQ	Essay	MCQ	TOTAL Marks
1	Problem Solving	40%	37					37
2	Reasoning and proof	20%	18					18
3	Communication	10%	09					09
4	Connection	15%	14					14
5	Visualization and representation	15%	14					14
	TOTAL	**100%**	**80 M (+12M choice)**	**6Q (12 Marks)**	**6Q (24 Marks)**	**6Q (24 Marks +12M choice)**	**20 Q (20 Marks)**	**80 M (+12M choice)**

Important Note:

➢ Question should be prepared as per the weightage of Academic Standards.
➢ There should be no deviation in Academic Standards, Problem Solving, Reasoning and Proof.
➢ There may be small deviation means upto 5% in Academic Standards, Communication, Connections and Visualization and Representation.

PART- A:

❖ The **Part-A** question Paper contains **THREE** sections. The **First section** includes **SIX very short answer type questions**, answer ALL of them. Each question carries **2 marks** and the total **marks** allotted to this section are **12**. The Solutions for these problems should be in general to **3-4 Steps**.

❖ The **Second section** includes **SIX short answer type questions**, answer ALL of them. Each question carries **4 marks** and the total **marks** allotted to this section are **24**. The Solutions for these problems should be in general to **5-6 Steps**.

❖ The **Third section** includes **SIX Essay type questions**, Answer any 4 out of 6 questions. Each question carries **6 marks** and the total **marks** allotted to this section are **24**. The Solutions for these problems should be in general to **8-10 Steps**.

PART- B:

❖ The **Part-B** Paper contains **TWENTY Multiple Choice Questions,** each question carries **1 mark** and the total marks allotted to this part are 20.
Marks will not be awarded for **OVERWRITING, CORRECTED and ERASED answers.**

❖ In MCQ questions, options such as All of the above, none of the above and both A and B should not be given.

General Instructions:

❖ Care should be taken while preparing question paper in such a way that questions must be given from **ALL allotted Units/ Lessons, but there is NO need to give unit/lesson-wise weightage in the question paper.**

❖ All questions in the question paper should be thought provoking, open ended, analytical. **Rote memory questions should be avoided in the question paper. The questions should test the understanding level of the student.**

❖ All questions should be without any ambiguity and they should be clear with objectivity.

❖ Sub-questions should not be given in the question paper. If it is needed can be given only for ONE QUESTION.

❖ The length of the Solution must be kept in mind while preparing different types of problems.

❖ While preparing question paper, avoid problems from the text book as it is, Can take those problems by changing their nature of questioning.

❖ The entire question paper should be prepared in such a way that 50% questions easy, 30% questions are average and the remaining 20% questions are of higher order thinking.

Mathematics – X E/M
Blue Print for this Model Paper

Sl. No.	Academic Standards.	Percentage	Marks	VSAQ (2)	SAQ (4)	Essay (6)	MCQ (1)	TOTAL Marks
1	Problem Solving	40%	37	2(4M)	2(8M)	2(12M)	13(13M)	**37**
2	Reasoning and proof	20%	18	2(4M)	1(4M)	1(6M)	4(4M)	**18**
3	Communication	10%	09	1(2M)	1(4M)	-	3(3M)	**09**
4	Connection	15%	14	-	2(8M)	1(6M)	-	**14**
5	Visualization and representation	15%	14	1(2M)	-	2(12M)	-	**14**
	TOTAL	**100%**	**80 M (+12M choice)**	**6Q (12 Marks)**	**6Q (24 Marks)**	**6Q (24 Marks +12M choice)**	**20 Q (20 Marks)**	**80 M (+12M choice)**

MATHEMATICS
Model Paper

Time: 3 hours   **Max. Marks: 80**

Instructions:

1. Answer all the questions under Part-A on a separate answer book.

2. Write the answers to the questions under Part-B on the question paper itself and attach it to the answer book of Part-A.

PART-A

Time: 2½ hours   Marks: 60

SECTION – I   (Marks: 6×2 = 12)

Note: (i)   Answer ALL the following questions.

    (ii)   Each question carries 2 marks.

1. If A = $\{x : x \in N, x < 5\}$ and B = $\{x : x \in N, 2 < x < 7\}$ then draw Venn diagram for A $\cup$ B.

2. Check whether the given pair of linear equations $x + 2y - 4 = 0$ and $2x + 4y - 12 = 0$ is intersecting lines or parallel lines.

3. Give one example each for an Arithmetic progression and a Geometric progression.

4. Find the probability of getting a 'vowel' if a letter is chosen randomly from English alphabet.

5. Find the volume of a Sphere whose radius is 2.8 cm

6. If A = 60° , B = 30° , then is it right to say Sin (A+B) = Sin A + Sin B?

SECTION – II   (Marks: 6×4 = 24)

Note: (i)   Answer ALL the following questions.

    (ii)   Each question carries 4 marks.

7. If log (1+tanθ+secθ) + log (1+cotθ-cosecθ) = log k ($0^{o}< θ < 90^{o}$) then find the value of k.

8. Write the formula for mode of a grouped data and explain each term of it.

9. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60°. If the tower is 100m high, then find the height of the building.

10. Prove that $x^2 + 2x + 1$ divides $x^4 - 2x^3 - 4x^2 + 2x + 3$ exactly.

11. In a circle of radius 3.5cm, a chord subtends a right angle at the centre. Find the area of the corresponding major segment (Take $\pi = \frac{22}{7}$)

12. Find the area of the triangle whose vertices are (5, 2) (3, -5) and (-3, -4).

SECTION – III   (Marks: 4×6 = 24)

Note: (i)   Answer any 4 of the following questions.

   (ii) Each question carries 6 marks.

13. Find mean for the following data.

CI	60-70	70-80	80-90	90-100	100-110	110-120	120-130
f	2	5	12	31	36	10	4

14. Prove that $\dfrac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1} = \dfrac{1 + \sin\theta}{\cos\theta}$

15. Solve $\dfrac{2}{x-1} + \dfrac{3}{y+1} = 2$ and $\dfrac{3}{x-1} + \dfrac{2}{y+1} = \dfrac{13}{6}$ where $x \neq 1, y \neq -1$

16. A metallic vessel is in the shape of a right circular cylinder mounted over a hemisphere. The common diameter is 56cm and the height of the cylindrical part is 21cm. Find the capacity of the vessel (Take $\pi = \frac{22}{7}$)

17. Solve the equations graphically $3x + 4y = 10$ and $4x - 3y = 5$

18. Draw a circle of radius 5cm. From a point 9cm away from its centre, construct a pair of tangents to the circle.

PART-B

Time: 30 minutes   Marks : 20

Note: (i)   Answer all the questions

(ii) Each question carries 1 mark

(iii) Answers are to be written in Question paper only

(iv) Marks will not be awarded in any case of over writing, rewriting or erased answers.

Note: Write the capital letters (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them.

Marks $20 \times 1 = 20$

1. The value of k for which the system of equations $4x + y = 3$ and $8x + 2y = 5k$ has infinite solutions is   ( )

    (A) $\frac{-5}{6}$ (B) $\frac{-6}{65}$ (C) $\frac{5}{6}$ (D) $\frac{6}{5}$

2. Among the following, a statement that is NOT true is   ( )

    (A) $\sin\theta = \sqrt{1 - \cos^2\theta}$ (B) $\sec^2\theta - \tan^2\theta = 1$

    (C) $\cos\theta.\csc\theta = 1$ (D) $\tan\theta.\cot\theta = 1$

3. The logarithmic form of $7 = 3^x$ is   ( )

    (A) $log_3 x = 7$ (B) $log_7 3 = x$ (C) $log_7 x = 3$ (D) $log_3 7 = x$

4. The decimal form of $\frac{3}{8}$ is   ( )

    (A) 3.75   (B) 0.365   (C) 0.375   (D) 0.0375

5. If 72, 63, 54, …, is an Arithmetic progression, then the term that becomes zero in it is   ( )

    (A) 11th (B) 10th (C) 9th (D) 8th

6. The equal set of A = $\{x : x$ is a letter of the word "FOLLOW"$\}$ is   ( )

    (A) {f, o, l, l, o, w}   (B) {f, o, l, l, w)   (C) {f, l, o, w}   (D) {f, o, l, o, w}

7. If n(A-B) = 5, n(B-A) = 7 and n(A∩B) = 3 then n(A∪B) is   ( )

    (A) 9   (B) 12   (C) 10   (D) 15

8. Among the following, the value which is not possible for the probability of an event is

    ( )

    (A) $\frac{1}{3}$ (B) 0.5   (C) 25%   (D) $\frac{4}{3}$

9. Among the following, a linear polynomial is   ( )

    (A) $3x^2 + 2x - 4$ (B) $2x + 3$ (C) 5   (D) $x^3 - 3x^2 + 7$

10. If p(x) = $x^2 - 2x + 2$ then the value of p(0) is   ( )

    (A) 4   (B) 0   (C) 2   (D) -2

11. The value of Discriminent of $x^2 + x + 1 = 0$ is ( )
    (A) 3   (B) 4   (C) -4   (D) -3

12. A quadratic equation whose roots are -2 and -3 is ( )
    (A) $x^2 - 5x - 6 = 0$ (B) $x^2 + 5x + 6 = 0$ (C) $x^2 + 5x - 6 = 0$ (D) $x^2 - 5x + 6 = 0$

13. If the product of the first 5 terms of a Geometric progression is 243, then its third term is ( )
    (A) 9   (B) 27   (C) 3   (D) 1

14. LCM of numbers $2^7 \times 3^4 \times 7$ and $2^3 \times 3^4 \times 11$ is ( )
    (A) $2^3 \times 3^4$ (B) $2^7 \times 3^4$
    (C) $2^7 \times 3^4 \times 7 \times 11$ (D) $2^3 \times 3^4 \times 7 \times 11$

15. In an Arithmetic progression n^{th} term is $a_n = a + (n - 1)d$. In this formula "d" represents ( )
    (A) Number of terms   (B) n^{th} term
    (C) First term   (D) Common difference

16. If Sin A = Cos A $(0^o < A < 90^o)$, then the value of 1+tanA is ( )
    (A) 1   (B) 3
    (C) 2   (D) 0

17. If the radius of a cylinder is doubled and its height is halved, then the volume of the new cylinder formed is ( )
    (A) 4 times the volume of the first cylinder
    (B) 3 times the volume of the first cylinder
    (C) 2 times the volume of the first cylinder
    (D) Volume remains the same

18. E and $\overline{E}$ are two complementary events in a random experiment. If $P(\overline{E}) = 0.07$ then the value of P(E) is ( )
    (A) 0.3   (B) 0.93   (C) 0.03   (D) 0.83

19. The mean of 9 observations is 45. In doing so, if an observation was wrongly taken as 42 for 24, then the correct mean of the data is ( )
    (A) 34   (B) 43   (C) 37   (D) 45

20. Base radii and heights of a cylinder and a cone are equal. If the volume of cone is 9cubic.units, then the volume of the cylinder is ( )
    (A) 27 cubic-units   (B) 18 cubic-units   (C) 9 cubic-units   (D) 36 cubic-units

-X-X-X-