



## Summative Assessment

Formative assessment is carried out at the end of a course or over a period of learning to measure how far the students have achieved the competencies / academic standards in the concerned subjects. It, certifies the level of achievement by the children only at a given point time at the best. The dates with time of Summative assessment tests will be intimated to students priorly. Written test is conducted on the prescribed syllabus, which is to be completed in that period of time. It is paper pencil test, that means, in this students may write their opinions / answers to the given questions, then the teachers observes / evaluates them and assess their progress.

### **Academic year – No. of Summative Assessments:**

In an academic year, 3 summative assessments are be conducted. Summative assessment will be conducted at school level, for 9<sup>th</sup> class 3 times and 2 times for 10<sup>th</sup> class, based on the question paper which is prepared by the teacher. In 10<sup>th</sup> class instead of 3<sup>rd</sup> Summative Assessment Public Exam is conducted by the Director of Govt. Examinations / Board. SA – 1, SA – 2 and SA – 3 in 9<sup>th</sup> class and SA – 1 and SA – 2 in 10<sup>th</sup> class are to be conducted as per SSC – Public examination pattern. By this children habituate and get exercises for SSC – Board exams from 9<sup>th</sup> class only. For this now we will observe the SSC – Public examination method – implementation.

### **Number of Papers – Chapters:**

As a part of Summative Assessment, mathematics public examinations are conducted through two papers i.e. Paper-I and Paper-II.

## Chapter for Paper-I and Paper-II:

In 10<sup>th</sup> class public examinations, for Paper-I, chapters related to the areas of Number system, Sets, Algebra, Progressions, Co-ordinate Geometry i.e.: (1) Real numbers, (2) Sets, (3) Polynomials, (4) Pairs of linear equations in two variables, (5) Quadratic Equations, (6) Progressions and (7) Co-ordinate geometry will be taken into consideration and questions are prepared based on these chapters only.

In Paper-II, chapters related to the areas of Geometry, Trigonometry, Mensuration, Statistics and Probability, i.e.: (1) Similar triangles, (2) Tangents and Secants to circles, (3) Mensuration, (4) Trigonometry, (5) Applications of trigonometry, (6) Probability, (7) Statistics will be taken into consideration and questions are prepared based on these chapters only.

**Marks:** Paper-I examination is conducted for 40 marks and Paper-II for 40 marks. Remaining 20 marks are allotted for formative assessment as internal marks. Thus, in this evaluation process 80% marks are allotted to Summative Assessment i.e. 10<sup>th</sup> class public examination and remaining 20% for formative assessment.

Subject	Total marks	Public examination marks	Formative Assessment marks
Maths paper-I	50	40	10
Maths paper-II	50	40	10

**Conducting process:** At school level Paper-I examination (for 9<sup>th</sup> class SA-1, SA-2, SA-3 and 10<sup>th</sup> class SA-1, SA-2) is conducted in the morning session and Paper-II in the after noon session on the same day. But in 10<sup>th</sup> class public examination, as SA-3 (i.e. public exams) paper-I on one day and paper-II on next day excluding the holidays, that means an examination per each day.

**Time:** In 10<sup>th</sup> class public examination, 15 minutes of times is given for reading the question paper and 2 ½ hrs time for answering the question paper, that means totally 2 hr – 45 min. of time is given for each paper 80, answer booklet is supplied to the children after 15 minutes only, issuing of the questing paper. It means that 15 min. of time only meant for reading of question paper only. This process is continued for 9<sup>th</sup> and 10<sup>th</sup> classes in the exams of the Summative Assessments.

**Pass Marks:**

35% is the pass percentage for the students. Totally on formative and summative assessments. There is no need to pass separately in formative assessment and summative assessment and as well as separately in paper-I and paper-II also. (As per guidelines G.O.Ms.No.17 and its amendments).

**Grading system:**

Grades are to awarded based on the total achieved marks achieved in Paper-I, Paper-II and Internal marks regarding to them. This method / process is to be followed for 9<sup>th</sup> and 10<sup>th</sup> classes for 100 marks the grading system is like this

Grade	Range of marks (100 marks)	Grade points
A1	91-100	10
A2	81-90	9
B1	71-80	8
B2	61-70	7
C1	51-60	6
C2	41-50	5
D1	35-40	4
D2	0-34	3

The average of total grades is considered as cumulative Grade Point Average (GPA)

**Weightage for Internal & External Formative and Summative Assessment:**

- 80% marks allotted to public examinations, remaining 20% marks for formative assessment.
- 20% marks for formative assessment, will be taken as 'average marks achieved in four formative assessments. This average calculation must be as shown below, (criteria).

<b>Sl. No.</b>	<b>Tool in the Formative Assessment</b>	<b>Marks</b>
1.	Creating new problems on given concepts	5
2.	Written work (class work, home work, written on their own)	5
3.	Project works	5
4.	Slip tests	5
	<b>Total</b>	<b>20</b>

- For FA – one note book is being maintained by every student. And make the students to write the above 1, 3, 4 items in that book, class work / home work separately). Thus conduct the F.A., and keep these records available at the time of inspection of authorities.
- Students must and should attend all the formative assessments. If at any case, a child is absent in such formative assessment, teacher has to conduct F.A. for the student separately and assess his/her progress and record it. After conducting the 4<sup>th</sup> formative assessment, observing all the records; the head of the school has to send the details of F.A. in a prescribed proforma through online. Regarding this software and other things will be looked after by the commissioner for Govt. exams.
- To make the children to prepare for the public examinations – SA-A and SA-2 are conducted for 80% marks only and remaining 20% marks will be allocated based on the formative assessments conducted previously.

SA-1 – as per above table 20% (FA1 + FA2) + 80% question papers.

SA-2 – as per above table 20% (FA1 + FA2 + FA3) + 80% question papers.

SA-3 (public examinations) – as per the above table 20% (FA1 + FA2 + FA3 + FA4) + 80% question papers.

- Conducting of Summative Assessment exams:

SA-1, SA-2, SA-3 are to be conducted in the following months, as shown in the table.

Summative Assessment	Month
SA-1	Sept./Oct.
SA-2	Dec./Jan.
SA-3	Mar./Apr.

### Quality Issues:

Generally questions are emphasized on content only. But in this present system, in every subject academic standards to be achieved in each class are identified. Teaching learning processes are intended to only to achieve that academic standards. So that, in evaluation process also, priority is given to assess the progress of the children based on these academic standards. For this question paper must be prepared based academic standards only.

#### a) Competencies – Academic Standards:

In mathematics, the following competencies / academic standards are identified.

- 1) Problem solving
- 2) Reasoning proof
- 3) Communication
- 4) Connections
- 5) Representation (visualization)

#### 1) Problem Solving:

For problem solving, questions may be based on the following contexts / criteria.

- Word problems
- Pictorial problems
- Understanding of data – analysis problems
- Problems related to tables – graphs.

Problem solving is depended on' number of steps, number processes, relevant data for the problem solving, method of solving and nature of the problem. Overall, the questions are framed based on the above parameters.

**2) Reasoning – Proof:**

The questions must be prepared on the following indicated, under this competency.

- Problems related to mathematical generalizations.
- Problems related to testing mathematical hypothesis.
- Problems – on giving reasons for particular steps – in problem solving.
- Problems on logical reasoning / testing the logic.
- Problem on testing the logic by inductive or deductive method.

Overall, justify? verify? Give examples? Give reasons? Prove it? Whether the given data is suitable or not, observe it? Explain the reason? Why? How? Type questions come under this competency.

**3) Communication:**

Under the “Communication” competency, problems / questions may be prepared based on the following indicators / contexts / topics, etc.

- Creating new problems on given mathematical concept / mathematical sentence.
- Converting the word problems into mathematical statements.
- Preparing tables from given data (Making grouped data).
- Problems on mathematical communication.
- Problems on explaining the mathematical thoughts in own words, as well as explaining the terms / symbols in a formula, etc.

**4) Connections:**

- Under the connection competency, problem / questions must be prepared based on the following indicators.
- Problems on connecting one area to another area in the mathematics with other subjects.
- Problems on connecting various concepts, methods to solve one problems.

**5) Representation – Visualization:**

Under this competency, the questions are prepared based on the following indicators/ contexts.

- Constructions
- Problems on data from tables, graphs
- Showing numbers on number line
- Problems on reading data from pictorial graph, bar graph, 2D-ictures, 3D-pictures
- Problems related to drawing pictures (2D/3D)
- Problems related to drawing graphs (pictorial graphs, bar graphs, cumulative curves, phi graphs, etc.)

**Note:-**

- Preparing frequency table from raw data in statistics comes under ‘communication’ competency.
- Preparing frequency table from raw data, and finding mean, median, mode for that data – comes under ‘problem solving’.
- Drawing graphs or cumulative curves for given frequency table – comes under representation and representation
- Draw graph for the problem? Comes under –representation & visualization.
- Draw graph and draw conclusion / find the particular – comes under problem solving.

**b) Nature of Questions:**

- Questions should not be based memory / recall and remembering.
- Questions must be "thought provoking" to write the answer. Questions must be analytical, connecting various concepts to solve, multiple answer – questions.
- No repetition of questions in public examinations
- Problems should not be given as it is, as they are in the exercise. But prepare same types new question as in the exercise and give them in public examination.

### Types of questions – weightage:

In 10<sup>th</sup> class public examinations, regarding mathematics, Paper-I, Paper-II, types questions will be prepared as shown below. Weightage table given for types of questions. As per the weightage table, number of questions are limited in this process, summative assessment (exams) are to be conducted for 9<sup>th</sup> and 10<sup>th</sup>.

Types of question – weightage table:

Sl. No.	Type of question	Marks for each question	No. of questions	Total marks	Remarks
1.	Essay type	4	4	16	Internal choice
2.	Short answer	2	6	12	No choice
3.	Very short answer	1	7	7	No choice
4.	Multiple choice questions	½	10	5	No choice
	<b>Short answer</b>		<b>27</b>	<b>40</b>	

### Weightage to Academic standards:

Thus, weightage to academic standards is also an important in preparing the question paper. In our mathematics 60% weightage has given to problem solving and remaining 40% has given to rest of academic standards. This weightage also to be followed for 9th & 10th classes in Summative Assessment, 80 teachers has to prepare the question paper as per the weightage table of academic standards.

Sl. No.	Academic Standards	% of weightage	Marks
1.	Problem solving	40%	16
2.	Reasoning – proof	20%	8
3.	Communication	10%	4
4.	Connection	15%	6
5.	Representation – visualization	15%	6
	<b>Total</b>	<b>100%</b>	<b>40</b>



Keeping in view of the above weightage tables, and considering the following indicators, question paper is to be prepared.

1. As per Table-I (types of questions – weightage table), internal choice is given for essay type answer questions. (4 marks for each question) 80 that student has to attempt first question or second question within the internal choice.
2. As per Table-I, there is no choice for short answer questions, very short answer questions, and multiple choice questions. So that student has to attempt all these questions.
3. As per Table-2 (academic standards – weightage) weightage given to 1<sup>st</sup> and 2<sup>nd</sup> Academic standards – should not be change at any circumstances Bus, based on the length of topics, concepts, weightage may be changed @ 5% for rest of 3 academic standards. This flexibility only limited SA<sub>1</sub>, SA<sub>2</sub> in the 10<sup>th</sup> class. Any how this weightage must be 100%, for maximum 40 marks only 80, in 9<sup>th</sup> class SA<sub>3</sub> examinations, question paper is to be prepared as per the above weightages in the table.
4. There is no chapter wise weightage. Questions may be prepared based on academic standards choosing any chapter from text book.
5. While asking questions from different chapters, any type of question may asked from any chapter. ‘4 marks questions may come from particular chapter, and 2 marks question may come from concerned chapters; this wrong concepts on should not be created. As per the context or situation any type of question may be selected / asked.
6. While preparing the question paper, we should follow the above two weightage tables.
7. Enclose the evaluation indicators along with the question paper.
8. The following abstract weightage table is enclosed with the question paper. But in the below weightage table, only weight is given to academic standards. Based on these weightage tables, we should prepare blue print for which type of questions? and how many are given? in each question paper. This blue print is not same for each question paper. Why because, considering concepts / topics from each chapter, according to the vision or thinking of the classroom teacher may prepare the different types of questions based on academic standards only. But every teacher keep in mind that equal priority given to all chapters, and ask / prepare the questions covering all the chapters. Any one chapter should not be given top priority, give equal priority all chapters. 80, make the children to learn all the chapters, which creates interest in learning mathematics, and make them to accelerate their progress.

Sl. No.	Academic Standards	weightage %	Marks	No. of questions			
				VSA questions	SAQ	Essay questions	MCQ
1.	Problem solving	40%	16				
2.	Reasoning proof	20%	8				
3.	Communications	10%	4				
4.	Connection	15%	6				
5.	Representation – visualization	15%	6				
	<b>Total</b>	100%	40	7	6	4	10

### Single Answer Booklet:

In our SSC – public examinations at present, along with the main answer sheet, additional sheets are being supplied, sometimes, there is scope for misuse of these additional sheets. To avoid all these, single answer booklet, having sufficient pages is supplied in new examination system. So, children have to write all the answers in that single answer booklet only. No additional sheet is supplied. So, don't waste the pages, while writing the answers. Based on the size of the answers to the questions, required pages in each answer booklet is estimated, and number of pages are calculated for the answer booklet. We should intimate to the children that they have to write all the answers in that answer booklet only, and make them understand how to write the answers properly, utilizing the space in the answer booklet.

### Competency wise model questions:

#### Problem solving:

1. What is the sum of the numbers which are divisible by 3 and in between 1 and 150.
2. Sum of two numbers is 1296. If a number is 16 times of another number, then find the numbers.
3. Find the remainder when  $x^4-3x^2+4$  is divisible by  $x-2$ .
4. Find arithmetic mean and median for the following data.

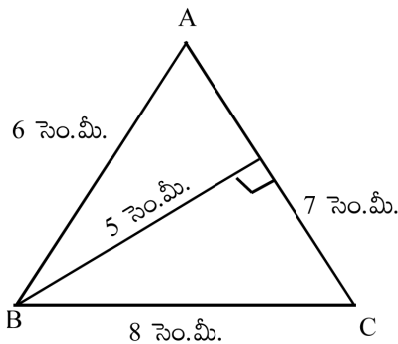
Class interval	51-60	61-70	71-80	81-90	91-100
Frequency	5	12	16	14	9

5. Ajay bought a TV for ₹ 14100/- and sold it for ₹ 15000/-. Find the loss percentage.
6. solve  $\frac{x-3}{8} - \frac{x+1}{6} + \frac{x-1}{4} = 1$
7. The marked price of a cell phone is ₹ 6000/- and its selling price is ₹ 5200/-. Find its discount percentage.
8. Find the square root and cube root of 15625.
9. Two year ago, the average age of 40 persons is 11 years. A person has dropped himself from that group now and average age of the remaining group has become 12 years. What is the age of the person who dropped himself from the group?
10. The circumference of a circle is 22cm. Find the area of semicircle of the circle.
11. Two vertices of a triangle are (3,-5) and (-7,4) and centroid of the triangle is (2,-1). Find the third side of the triangle.

#### Reasoning and proof :

1. Whether  $\sqrt{2}$  is rational or irrational? Explain with reasons
2. Whether (3, 4, 5) are Pythagoras triplets or not? Explain with reasons

- $n(n+1)(n+2)$  is always divisible by 6 for all  $n \in \mathbb{N}$ . why? Explain with reasons.
- Can we construct a triangle with length of the sides 5cm, 3cm and 10cm? Explain with reasons
- Area of the following triangle in Raghu's opinion is  $\frac{1}{2} \times 7 \times 5$  and in Mary's opinion is  $\frac{1}{2} \times 8 \times 5$ . Who is right and why?



- Choose some triplets of consecutive odd numbers and find the product of the numbers in each triplet. Have you observe any pattern? And what can you generalise from that pattern?

**Communication :**

- Express the following in standard form
  - 0.000000000175
  - 201405170678
- Explain every variable in volume of a cylinder  $V = \pi r^2 h$ .
- Express the following in exponential form
  - 243
  - 10000
  - 1024
- Express  $\overline{0.7}$  in fractional form.
- The cost of a fountain pen is ₹ 5 less than that of a ball pen. Express this information using x,y as variables.
- What is right triangle? Explain.
- What does “r” represent in  $V = \frac{4}{3} \pi r^3$ ?

**Connections:**

1. Find the area of the circle which is inscribed in a square with side 28cm.
2. A ball is vertically thrown upwards with initial velocity 80 m/sec from a building of 96 m height. The ball is at the distance  $S = 96 + 80t - 16t^2$  away from ground after  $t$  seconds. After how much time it will reach the ground?
3. Area of a rectangle is represented by  $6x^2 - 11x - 10$ . Represent the length and breadth of the rectangle by possible binomials.
4. There is a cone having equal height and equal radius of base with those of a cylinder. Show that ratio of their volumes is 3:1.
5. A sphere with 4.2 cm radius is moulded into a cylinder having 6cm radius of base. Then what is the height of the cylinder?

**Representation - Visualisation:**

1. Represent  $\sqrt{5}$  on number line.
2. The ratio of milk and water in a liquid of 35 litres is 5:2. Represent this information in a linear equation and thus on a graph.
3. Represent the following points on a graph and join each pair.
 

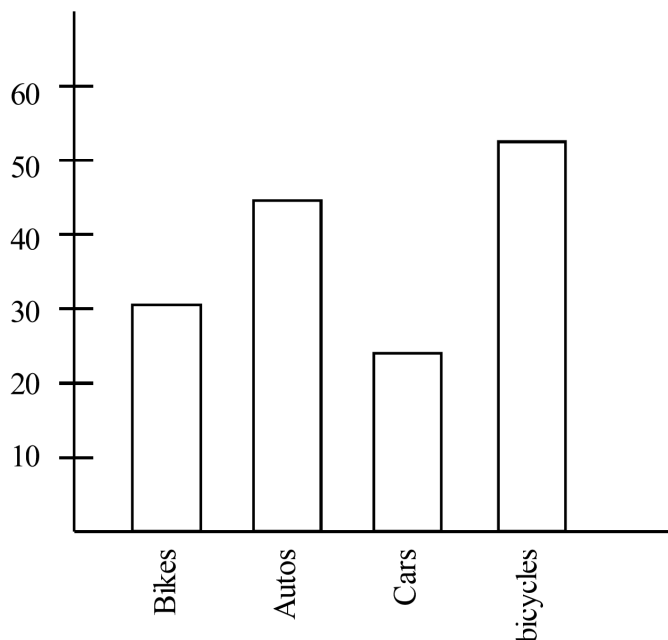
a. (1, 0) (0, 8)	b. (2, 0) (0, 7)
c. (3, 0) (0, 6)	d. (4, 0) (0, 5)
e. (5, 0) (0, 4)	f. (6, 0) (0, 3)
g. (7, 0) (0, 2)	h. (8, 0) (0, 1)
4. Construct a triangle ABC with  $\angle B = 45^\circ$ ,  $\angle C = 60^\circ$  and  $AB + BC + CA = 12$ cm.

5. The yielding of a crop per hectare of 50 farmers in a village is given in the following table.

Yielding (in quintals)	50-55	55-60	60-65	65-70	70-75	75-80
No. of farmers	2	4	6	12	18	8

Draw aogive curve for the above data

6. Prepare a frequency table for the following histogram.



### Preparation of questions under different competencies/ academic standards with a single data.

1. Data:  $\sqrt{2}$ 
  - a. Problem solving: Find the value of  $\sqrt{2}$  for three decimals
  - b. Reasoning- proof: Whether  $\sqrt{2}$  is rational or irrational?
  - c. Representation –visualisation: represent  $\sqrt{2}$  on number line.
2. Data: In a triangle ABC, AB=8cm, BC=6cm and AC =10cm.
  - a. Problem solving: Find the possible ratios in between any two sides of a triangle ABC with sides AB=8cm, BC=6cm and AC =10cm.

- b. Reasoning–proof: It is given for a triangle ABC,  $AB=8\text{cm}$ ,  $BC=6\text{cm}$  and  $AC =10\text{cm}$  and  $BC:AC=5:3$ . Verify whether the given information is correct or not?
- c. Communication: It given that the sides of a triangle are 3, 4 and 5 times of a number. Then express this in the form a ratio.
- d. Connections: If the sides of a triangle are in the ratio 3:4:5 and its perimeter is 24cm, then find its sides.
- e. Representation–visualisation: construct a triangle with sides  $AB=8\text{cm}$ ,  $BC=6\text{cm}$  and  $AC =10\text{cm}$ .

### Question Papers - Preparation Indicators:

- Questions in the question paper should not based on memorization.
- Questions must be thought provoking. Questions must be analytical, and connecting different concepts to solve the problem, multi answers questions also be included.
- Once a question asked in the public examination, it should not be separated as it is in future public examinations. This type of new questions are to be given.
- In essay types answer questions, under single academic standards only internal choice (two) questions are given.
- According weightage to types of questions and weightage to academic standards tables, questions are to be prepared.
- While giving essay type questions, mainly word problems, problems have more logics, problems having 2 or 3 processes, more thought provoking, constructions, solving questions, graph type questions may be given.
- Under short answer type questions, questions having 1 or 2 processes, direct answerable, with in  $\frac{3}{4}$  - steps answerable, having small explanations - type questions may be given.
- Short problems, orally calculated problem, definitions, principles or symbols - based questions etc., are given under very short answer type questions.
- Multiple choice questions must be less time taken, oral thinking and calculated type are given 4 answers of a each MC question, lead the child that each question may be suitable for the given question.

- In case, in any chapter, if we don't find essay type answerable question, two short-answer questions together asked under essay typed question.
- Before preparing the question paper, blue print must be prepared. The question paper is to be prepared, based on that blue print only. Blue print is not same for every question paper. Model blue print given separately for paper-I and Paper-II, for understanding the preparation of question paper. Model question paper also given. So observe them for understanding.

**Maths – Paper – I, - Blue Print**

<b>Competency</b>	<b>Weightage %</b>	<b>Essay questions (4)</b>	<b>Short answer questions (2)</b>	<b>Very short answer questions (1)</b>	<b>Multiple choice questions (½)</b>
Problem solving	40%	2(8)	2(4)	3(3)	2(1)
Reasons - proof	20%	-	2(4)	2(2)	4(2)
Communications	10%	-	-	2(2)	4(2)
Connection	15%	1(4)	1(2)	-	-
Representation in visualization	15%	1(4)	1(2)	-	-

**Maths - Paper - II, - Blue Print**

<b>Competency</b>	<b>Weightage %</b>	<b>Essay questions (4)</b>	<b>Short answer questions (2)</b>	<b>Very short answer questions (1)</b>	<b>Multiple choice questions (½)</b>
Problem solving	40%	2(8)	2(4)	3(3)	2(1)
Reasons - proof	20%	-	2(4)	2(2)	4(2)
Communications	10%	-	-	1(1)	2(1)
Connection	15%	1(4)	1(2)	-	-
Representation in visualization	15%	1(4)	1(2)	1(1)	1(1)



**Summative Assessment III - Model Paper  
Mathematics**

**(English Version)**

*(Real numbers, Sets, Polynomials, Pair of linear equations in two variables,  
Quadratic equations, Progressions, Coordinator geometry)*

**Time :** 2 Hours 45 Minutes

**Paper-I**

**Max. Marks :** 40

- Instructions :**
1. Read the following question paper and understand every question thoroughly without writing anything. 15 minutes time is allotted for this.
  2. Answer all the questions from the given four sections.
  3. Write answers to the objective type questions (Section-IV) on answer sheet, but at the same place.
  4. In Section-III, every question has internal choice. Answer to anyone alternative.

**Section-I**

**Answer every question. Each question carries one mark.**

**7x1=7**

1. How do you find the distance between two points on the line parallel to x-axis. Explain.
2. If the slope of line segment joining P(-2, 3), Q(x, 6) is -1, then find x. (P.S.)
3. Simplify  $\log_9 243$ .
4. Find cubic polynomial with the zero values -7, 1, 2.
5. Can x+2, x+4 and x+9 be in A.P. Justify your answer.
6. Difference between a two digit number and the number formed by interchanging its digits is 36. Express this data as an algebraic equation.
7. Explain the characteristic of a line passing through points (-5, 2), (0, 2), (3, 2), (5, 2).

**Section-II**

**Answer every question. Each question carries 2 marks.**

**6x2=12**

8. If  $A = \{1, 3, 6, 9\}$ ,  $B = \{1, 2, 3, 4, 5, 6\}$  then show  $A \cup B$  and  $A - B$  as Venn diagrams.
9. Are sets of multiples of 3 and multiples of 2 disjoint sets. Justify your answer?

10. Find the ratio in which y-axis divides the line segments joining the points A(3, 2), B(-1, 2).
11. Find the area of a rectangle whose length and breadth are the roots of the quadratic equation  $x^2 - 6x + 8 = 0$ .
12. If  $(3 \times 4 \times 5 \times 7) + (19 \times 21 \times 23)$  a composite number. Justify your answer.
13. If 6th term of a G.P. is 46875 and its 4th term is 375. Find its 9th term.

### Section-III

Answer every question. Each question carries 4 mark.

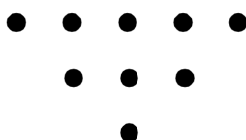
4x4=16

- 14(A) The length and breadth of a rectangular metal sheet are in the ratio 7 : 5. Four  $3\text{cm} \times 3\text{cm}$  squares have been separated from the corners of that rectangle and it has been moulded into a cuboid of  $96\text{ cm}^3$  of volume. Find the area of the rectangular metal sheet taken in the beginning.

(OR)

- (B) A stone is thrown vertically upwards from a building of 96 ft height with an initial velocity of 116 ft/sec. If the acceleration due to gravity is  $32\text{ ft/sec}^2$ , then after how many seconds the stone will reach the ground.

- 15(A) Rama has arranged 256 dots to draw a rangoli in the following ways. In how many rows has she arranged the dots.



(OR)

- (B) In a nuclear fusion reaction a  $U^{235}$  nucleus will split into two lighter nuclei, creating 3 neutrons and 200 MeV of energy. These three neutrons will again split three  $U^{235}$  nuclei. Find the energy released if this process continues for 10 stages.

- 16(A) Draw the graph of  $p(x) = x^2 - 12x + 35$  and find the zeroes of the polynomial of it.

(OR)

- (B) The product of two consecutive multiples of 3 is 81. Form a quadratic equation and by using this information draw its graph.

17(A) Find the sum of all the multiples of 2 or 3 between 100 and 200 (100 and 200 are not included).

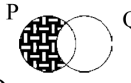
(OR)

(B) 5 women and 3 men having same capacity can complete a work in 6 days. And 3 men, 3 women of same capacity together complete the same work in 9 days, then in how many days a woman or a man can complete the work.

### Section-IV

Choose the right answer A, B, C, D and write the correct answer.

$10x^{1/2}=5$

18.  $A = \{1, 2, 3, 4, 5, 6\}$ ,  $B = \{2, 4, 6\}$  then  
 A)  $B \in A$       B)  $A \in B$       C)  $B \subset A$       D)  $A \subset B$
19. If there is no  $x$  term in a cubic polynomial then  
 A)  $\alpha + \beta + \gamma = 0$       B)  $\alpha\beta + \beta\gamma + \alpha\gamma = 0$       C)  $\alpha + \beta + \gamma = 0$       D) Not possible
20. The product of two consecutive numbers is 56. Then quadratic equation formed by this is  
 A)  $x^2 + x - 56 = 0$       B)  $x^2 - x + 56 = 0$   
 C)  $x^2 + x + 56 = 0$       D)  $x^2 - x - 56 = 0$
21. If  $x$ -coordinates of two points are zero. Then slope of the line segment joined by these two points is  
 A) 0      B) 1      C) -1      D) not defined
22. 1, -2, 4, -8, ..... is  
 A) AP      B) GP      C) Both      D) None of these
23.  $A = \{x : x \in \mathbb{N}; x \leq 0\}$  then  
 A)  $A = \{0\}$       B)  $A = 0$       C)  $A = \{\phi\}$       D)  $A = \phi$
24. In the rational form of a terminating decimal number prime factor of the denominator is  
 A) 5 only      B) 2 only      C) 2 or 5 only      D) Any prime
25. Shaded Region represented by the venn diagram   
 A)  $P \cup Q$       B)  $P \cap Q$       C)  $P - Q$       D)  $Q - P$
26. Common difference of an AP is 3. If 2 is added to every term of the progression, then the common difference new AP  
 A) 5      B) 6      C) 3      D) 2
27. If slopes of line segments AB and BC are equal then the area of  $\triangle ABC$  is  
 A) Positive      B) Zero      C) Negative      D) Imaginary

## Summative Assessment III - Model Paper

### Mathematics

(English Version)

(Similar triangles, Tangents and secants to a circle, Mensuration, Trigonometry, Applications of trigonometry, Probability, Statistics)

Time : 2 Hours 45 Minutes

Paper-II

Max. Marks : 40

- Instructions :**
1. Read the following question paper and understand every question thoroughly without writing anything. 15 minutes time is allotted for this.
  2. Answer all the questions from the given four sections.
  3. Write answers to the objective type questions (Section-IV) on answer sheet, but at the same place.
  4. In Section-III, every question has internal choice. Answer to anyone alternative.

### Section-I

Answer every question. Each question carries one mark.

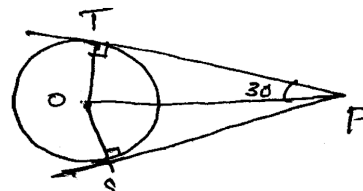
7x1=7

1. The information related to the health tests conducted for students of a class are as follows :

Blood Group	A	AB	B	O
Number of Students	10	13	12	5

If a student is selected at random from this class, then find the probability for the blood group of that selected boy to be 'B'.

2. If a cone, hemisphere, cylinder are on the same base and having the same height, then what is the ratio of their volumes. Justify your answer.
3. Write trigonometric identity in Tan  $\theta$  and Sec  $\theta$ .
4. If the length of shadow of a tower is  $\sqrt{3}$  times its height, then the angle with which a person standing at the end of the shadow will see the top of the tower.
5. For a circle with centre 'o', 'p' is an external point. If PS and PT are tangents drawn to the circle, then find  $\angle POS$ .



6. Which has greater value among  $\cos 6^\circ$  or  $\cos 60^\circ$ ? Why?
7. Explain the procedure to find median of ungrouped data.

### Section-II

Answer all questions. Each question carries 2 marks.

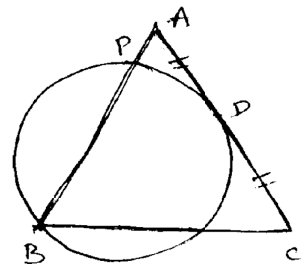
6×2 = 12

8. Prepare ascending cumulative frequency table for given below.  
In a company the salaries of employees and their number like this.

Employees salary	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Number of employees	4	45	20	13	9	7	2

9. If  $\tan \theta + \sin \theta = m$ ,  $\tan \theta - \sin \theta = n$ , then express the value of  $m^2 - n^2$  in terms of  $m$  and  $n$ .
10. In a leap year find the probability of getting 53 Sundays. Similarly find the probability of getting 54 Sundays. Justify your answer.
11. A square of side 25 cm is divided into  $n^2$  equal small squares. If circles are drawn in each of these small squares touching all the sides, then find the area of the given square not covered by these circles.
12. If there spheres of radius 3 cm, 4 cm and 5 cm are melted and cast into a large sphere, then find the radius of the large sphere so formed.
13. Triangle ABC is an isosceles triangle in which  $AB = AC$ . Point D is mid point of AC. If a circle is drawn passing through B, intersecting AB at P and 'D' as point of contact so that AC is a tangent to the circle at D, then prove that

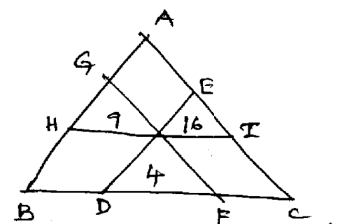
$$AP = \frac{1}{4} AB.$$



### Section-III

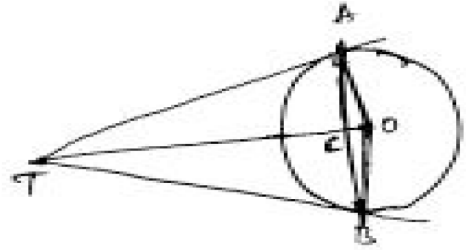
Every question is provided with internal choice. Each question carries 4 marks.

- 14(A) From any point in the interior of the triangle, lines are drawn parallel to the sides of it. If the areas of the three small triangles thus formed are 4, 9 and 16 square units then find the area of the given larger triangle.



(OR)

- (B) For a circle with centre 'o', point 'T' is an external point. TA and TB are tangents drawn to the circle from T. Chord AB intersects  $\overline{AO}$  at C. If  $\frac{1}{OA^2} + \frac{1}{TA^2} = \frac{1}{36}$  then find the value of AB.



- 15(A) The Crop yielding for a hectar of 100 farmers of a village is given as follows :

Crop yielding (in quintols)	30-35	35-40	40-45	45-50	50-55	55-60
No. of farmers	4	6	12	24	32	22

Represented the above data in the form of a less than cumulative frequency curve.

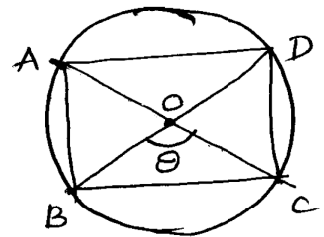
(OR)

- (B) Draw a line segment AB of length 10 cm. With 'A' as centre and 5 cm radius draw a circle. With 'B' as centre and 3 cm radius draw another circle. Draw tangents from centre of each circle to the other circle.

- 16(A) The perpendicular sides of a right triangle are 6 cm and 8 cm. If it is rotated about its hypotenuse, then find the volume of the double cone so formed.

(OR)

- (B) A rectangle ABCD is inscribed in a circle of radius 6 cm. Diagonals of that rectangle intersect at 'o' and one of the angles thus formed is 'θ' then find the area of the rectangle ABCD in terms of 'θ'.



- 17(A) A tree was broken by a wind and top of the tree is touching the ground making an angle of  $30^\circ$ . If the point where top touches the ground to the bottom of the tree is 20m, then find the height of the tree before it was broken.

(OR)

- (B) Find Arithmetic mean for the following data.

Marks	0-9	10-19	20-29	30-39	40-49	50-59
Number of students	3	8	14	21	9	5

Section-IV

Answer all questions. Each question carries  $\frac{1}{2}$  mark.

$$10 \times \frac{1}{2} = 5$$

18. In  $\Delta ABP$ , if 'c' is a point on BP such that  $\angle PAC = \angle ABC$ , then PC.PB is equal to

- A)  $AP^2$                       B)  $AC^2$                       C)  $AB^2$                       D)  $BC^2$

19. The average of 13 scores is 8. If one of the scores 20 is deleted from them, then the average of the remaining scores is

- A) 7                              B) 5                              C) 21                              D) 12

20. which one of the following is equal to  $\sin x$  is

- A)  $\frac{\sqrt{1-\cos^2 x}}{\cos x}$       B)  $\frac{\tan x}{\sqrt{1-\tan^2 x}}$       C)  $\frac{\sin x}{\sqrt{1-\sin^2 x}}$       D)  $\frac{\sqrt{1+\cos^2 x}}{\cos x}$

21. Which one of the following is true

A) When two coins are tossed there are three possible outcomes, two heads, two tails, one head and one tail so probability of getting two heads is  $\frac{1}{4}$

B) When a dice is rolled the possible outcome is an even number or odd number so probability of getting odd number is  $\frac{1}{2}$

C) A deck of 52 cards contain 4 suits. So the probability of a selected card to become ace is  $\frac{1}{13}$

D) Out of three students, the probability for two students to have the same date of birth in a year is 3.65

22. ABCD is a quadrilateral and a circle touches the sides of it at points P, Q, R and S respectively then which one of the following is true.

- A)  $AB + CD = BC + DA$                       B)  $AB + AD = BC + CD$   
 C)  $AD + DC = AD + BC$                       D)  $AB + BC + CD < AD$

23. In  $\Delta PQR$ , E and F are points on sides PQ and PR respectively. In which of the following situations we set  $EF \parallel QR$

A)  $\frac{PQ}{PE} = \frac{PR}{PF}$

B)  $\frac{PE}{EQ} = \frac{PF}{FR}$

C)  $\frac{PE}{EQ} = \frac{PF}{FR}$

D)  $\frac{PE}{EF} = \frac{PF}{FR}$

24. In the formula of mode

$$\text{mode} = l + \left[ \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right] \times h, f_0 \text{ represents}$$

A) frequency of preceding model class

B) frequency of succeeding model class

C) frequency of model class

D) frequency of zero model class.

15. p : Every angle in an equilateral triangle is  $60^\circ$

q : Every angle in an equilateral triangle is not  $60^\circ$  then

A)  $q \cong p$

B)  $p \cong \sim(\sim q)$

C)  $\sim p \cong q$

D)  $p = q$

26. In a  $\Delta ABC$  are D, E and F are mid points of AB, BC and CA respectively. If  $\Delta ABC = 16 \text{ cm}^2$  then are  $\Delta DEF = \dots\dots\dots$  then

A)  $4 \text{ cm}^2$

B)  $16 \text{ cm}^2$

C)  $64 \text{ cm}^2$

D)  $32 \text{ cm}^2$

27. For an acute angle A,  $\sin A = \cos A$  then

A)  $\angle A = 30^\circ$

B)  $\angle A = 45^\circ$

C)  $\angle A = 60^\circ$

D)  $\angle A = 75^\circ$