

Mathematics - Unit Test

Model Paper

Weightage Tables

Table : 1 Weightage to Academic Standards

| S. No. | Academic Standards | Weightage % | Marks |
|--------|--------------------------------|-------------|-----------|
| 1. | Problem Solving | 40 | 10 |
| 2. | Reasoning & Proof | 20 | 5 |
| 3. | Communication | 12 | 3 |
| 4. | Connections | 16 | 4 |
| 5. | Representation & Visualisation | 12 | 3 |
| | Total | 100% | 25 |

Table : 2 Weightage to Content

| S. No. | Chapter | Weightage % | Marks |
|--------|--------------|-------------|-----------|
| 1. | Real numbers | 48% | 12 |
| 2. | Sets | 20% | 5 |
| 3. | Polynomials | 32% | 8 |
| | | 100% | 25 |

Table : 3 Weightage to difficulty level

| S. No. | Difficulty level | Weightage % | Marks |
|--------|------------------|-------------|-----------|
| 1. | Easy | 24% | 06 |
| 2. | Average | 52% | 13 |
| 3. | Difficulty | 24% | 06 |
| | | 100% | 25 |

Table : 4 Weightage to type of questions

| S. No. | Type of Questions | Weightage % | No. of Questions | Marks |
|--------|-------------------|-------------|------------------|-----------|
| 1. | Objective | 28% | 07 | 07 |
| 2. | Short Answer | 40% | 05 | 10 |
| 3. | Essay | 32% | 02 | 08 |
| | | 100% | 14 | 25 |

Blue Print
Unit: Containing Chapters Real Numbers, Sets & Polynomials

Academic Standards

| S.No. | Content | Problem Solving | | | | Reasoning & Proof | | | | Communication | | | | Connection | | | | Representation | | | | |
|-------|--------------|------------------|------------------|------------------|-------|-------------------|----|------------------|-------|------------------|------------------|---|-------|------------------|------------------|---|-------|------------------|------------------|---|-------|----|
| | | Obj | SA | E | Total | Obj | SA | E | Total | Obj | SA | E | Total | Obj | SA | E | Total | Obj | SA | E | Total | |
| 1. | Real Numbers | (1) ¹ | (1) ² | - | 03 | - | - | (1) ⁴ | 04 | (1) ¹ | - | - | 01 | (1) ¹ | (1) ² | - | 03 | (1) ¹ | - | - | 01 | 12 |
| 2. | Sets | - | (1) ² | - | 02 | (1) ¹ | - | - | 01 | - | (1) ² | - | 02 | - | - | - | - | - | - | - | - | 05 |
| 3. | Polynomials | (1) ¹ | - | (1) ⁴ | 05 | - | - | - | - | (1) ¹ | - | - | - | (1) ¹ | - | - | 01 | - | (1) ² | - | 02 | 08 |
| | | (2) ¹ | (2) ² | (1) ⁴ | 10 | (1) ¹ | - | (1) ⁴ | 05 | (1) ¹ | (1) ² | - | 03 | (2) ¹ | (1) ² | - | 04 | (1) ¹ | (1) ² | - | 03 | 25 |

Mathematics - Unit Test
(Real numbers, sets, Polynomials)

Class: X

Max Marks: 25

Time: 45 min

Instructions:

- The question paper consists of three sections.
- All questions are compulsory.

Section - I

7 × 1 = 7 marks

Note:

1. Answer all the questions. Each question carries 1 mark.
2. Choose the correct answer from the four alternatives given for each question and write capital letters A, B, C or D in the brackets.

1. The prime factorisation form of 156 ()
A) $2 \times 3 \times 13$ B) $2^2 \times 3^2 \times 13$ C) $2^2 \times 3 \times 13$ D) $2 \times 3^2 \times 13$
2. The logarithmic form of $8^x = 2$ ()
A) $\log_x 8 = 2$ B) $\log_8 2 = x$ C) $\log_x 2 = 8$ D) $\log_2 x = 8$
3. The $\frac{p}{q}$ form of the decimal 0.875 ()
A) $\frac{7}{2^3}$ B) $\frac{7}{16}$ C) $\frac{3}{8}$ D) $\frac{7}{2^2}$
4. Which of the following integers does $\frac{3}{4}$ lies between ()
A) 0 and 1 B) 1 and 2 C) 3 and 4 D) -1 and 1
5. $A = \{x/x \text{ is a boy}\}$ $B = \{x/x \text{ is a girl}\}$ them ()
A) $A \cup B = \phi$ B) $A \cap B \neq \theta$ C) $A - B = A$ D) $A - B = \phi$
6. The zero of the polynomial $2x-3$ ()
A) $\frac{2}{3}$ B) $\frac{3}{2}$ C) $-\frac{2}{3}$ D) $-\frac{3}{2}$
7. one of the following algebraic expression is not a polynomial ()
A) $-2x^2$ B) $\sqrt{2}x+5$ C) $x+\frac{1}{x}$ D) $5-2x$

Section - II

5 × 2 = 10 marks

Note:

1. Answer all the questions.
2. Each question carries 2 marks.

8. Write the following rationals as decimals without actual division

i) $\frac{13}{25}$ ii) $\frac{143}{110}$

9. Expand $\log \sqrt{\frac{x^3}{y^2}}$

10. If $A = \{1, 2, 3\}$, $B = \{2, 3, 4, 5\}$ find $A \cup B$ and $A \cap B$

11. Write the following sets in roster form

(i) $A =$ The set of natural numbers less than 7

(ii) $B = \{x : x \text{ is a letter in the word 'School'}\}$

12. Draw the graph of $P(x) = x - 2$ and find where it intersects X-axis.

Section - III

2 × 4 = 8 marks

Note:

1. Answer all the questions, choosing one from each question.
2. Each question carries 4 marks.

13. Prove that $\sqrt{2}$ is irrational by the method of contradiction

(or)

Prove that $3 - 2\sqrt{5}$ is irrational.

14. Find the zeros of the quadratic polynomial $x^2 + 5x + 6$ and verify the relationship between the zeroes and coefficients.

Divide $3x^3 + x^2 + 2x + 5$ by $3x - 1$ and verify the result with division algorithm.

X class Mathematics
(2014-15)
Unit wise Division of Syllabus

Unit - I:

1. Real numbers
2. Sets
3. Polynomial

Unit - II:

1. Similar Triangles
2. Linear Equations in 2 variables

Unit - III:

1. Progressions
2. Tangents and secants to a circle

Unit - IV:

1. Application of Trigonometry
2. Probability

X class
Mathematics (2014-15)
Chapter wise Division of Syllabus
Under Paper I and Paper II

Paper - I

1. Real numbers
2. Sets
3. Polynomials
4. Pair of Linear equations in two variables (
5. Quadratic Equations
6. Progressions
7. Co-ordinate Geometry

Paper - II

1. Similar Triangles
2. Tangents and secants to a circle (
3. Mensuration
4. Trigonometry
5. Applications of Trigonometry (
6. Probability
7. Statistics

SSC Public Examinations - March - 2015

Model Paper - Mathematics

Weightage Tables

Paper - 1

Table - 1: Weightage to Academic Standards

| S. No. | Academic Standards | Weightage (%) | Marks | Paper-I |
|--------|---------------------|---------------|-----------|-----------------------------------|
| 1. | Problem Solving | 40% | 32 | |
| 2. | Reasoning and Proof | 20% | 16 | Part A- 64 marks |
| 3. | Communication | 10% | 08 | Part B- 15 marks |
| 4. | Connection | 15% | 12 | |
| 5. | Representation | 15% | 11 | |
| | Total | 100% | 79 | Including choice questions |

Table : 2 Weightage to Content

| S. No. | Cotent Area | Weightage % | Marks |
|--------|---------------------|-------------|-----------|
| 1. | Number System | 24% | 19 |
| 2. | Algebra | 60% | 47 |
| 3. | Co-ordinate Gemetry | 16% | 13 |
| | Total | 100% | 79 |

Table : 3 Weightage to difficulty level

| S. No. | Difficulty level | Weightage % | Marks |
|--------|------------------|-------------|-----------|
| 1. | Easy | 25% | 20 |
| 2. | Average | 50% | 39 |
| 3. | Difficuly | 25% | 20 |
| | Total | 100% | 79 |

Table - 4: Weightage to type of Questions

| S. No. | Type of Questions | Weightage (%) | No. of Questions | Marks |
|--------|----------------------------|---------------|------------------|-----------|
| 1. | Objective type (½) | 19% | 30 | 15 |
| 2. | Very short answer type (1) | 08% | 06 | 06 |
| 3. | Short answer type (2) | 20% | 08 | 16 |
| 4. | Essay type (4) | 41% | 08 | 32 |
| 5. | Graph (5) | 12% | 02 | 10 |
| | Total | 100% | 54 | 79 |

Table - 5: Area wise, Standard wise Division of Question paper

| Q.No. | Marks | Area | Ae. Std | Q.No. | Marks | Area | Ae. Std |
|---------------|-------|----------|---------|--------|-------|----------|---------|
| PART-A | | | | | | | |
| 1 | 2 | Num.Sys. | PS | 28(4) | ½ | Algebra | COM |
| 2 | 2 | Num.Sys. | R/P | 29(5) | ½ | Algebra | CON |
| 3 | 2 | Algebra | PS | 30(6) | ½ | Algebra | REP |
| 4. | 2 | Algebra | PS | 31(7) | ½ | Co-Geo | PS |
| 5. | 2 | Algebra | COM | 32(8) | ½ | Co-Geo | PS |
| 6. | 2 | Algebra | CON | 33(9) | ½ | Co-Geo | R/P |
| 7. | 2 | Co-Geo | PS | 34(10) | ½ | Co-Geo | CON |
| 8 | 2 | Co-Geo | CON | 35(11) | ½ | Num.Sys. | R/P |
| 9. | 1 | Num.Sys. | PS | 36(12) | ½ | Num.Sys. | REP |
| 10. | 1 | Num.Sys. | PS | 37(13) | ½ | Algebra | PS |
| 11. | 1 | Num.Sys. | CON | 38(14) | ½ | Algebra | R/P |
| 12. | 1 | Algebra | PS | 39(15) | ½ | Algebra | COM |
| 13. | 1 | Algebra | CON | 40(16) | ½ | Algebra | CON |
| 14. | 1 | Co-Geo | COM | 41(17) | ½ | Co-Geo | PS |
| 15. | 4 | Num. Sys | | 42(18) | ½ | Co-Geo | PS |
| 16. | 4 | Num. Sys | PS | 43(19) | ½ | Co-Geo | COM |
| 17. | 4 | Algebra | R/P | 44(20) | ½ | Co-Geo | CON |
| 18. | 4 | Algebra | PS | 45(21) | ½ | Num.Sys. | COM |
| 19. | 4 | Algebra | PS | 46(22) | ½ | Num.Sys. | CON |
| 20. | 4 | Algebra | RP | 47(23) | ½ | Num.Sys. | COM |
| 21. | 4 | Algebra | CON. | 48(24) | ½ | Num.Sys. | COM |
| 22. | 4 | Co-Geo | PS | 49(25) | ½ | Num.Sys. | COM |
| 23. | 5 | Algebra | REP | 50(26) | ½ | Algebra | PS |
| 24. | 5 | Algebra | REP | 51(27) | ½ | Algebra | PS |
| PART-B | | | | | | | |
| 25(1) | ½ | Num.Sys. | PS | 52(28) | ½ | Algebra | PS |
| 26(2) | ½ | Algebra | PS | 53(29) | ½ | Algebra | PS |
| 27(3) | ½ | Algebra | R/P | 51(30) | ½ | Algebra | PS |

Mathematics - Paper - I
(English Version)
Part A and B

Time: 2½ hours

Max Marks: 50

Instructions:

1. Answer 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 answerbook of Part - A
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Part-A

Section - I

Time: 2 hours

Marks: 35

Note:

1. Answer any five questions choosing at least two from each of the following two group, i.e., A and B.
2. Each question carries 2 marks.

Group - A

(Real numbers, sets, polynomials, Quadratic Equations)

1. Find H.C.F. and L.C.M. of 220 and 284 by Prime factorisation method.
2. Check whether $A = \{x: x^2 = 25 \text{ and } 6x = 15\}$ is an empty set or not? Justify your answer.
3. The sum of zeroes of a quadratic polynomial $Kx^2 - 3x + 1$ is 1, find the value of K.
4. Find two numbers where sum is 27 and product is 182.

Group - B

(Linear Equations in two variables, Progressions, Co-ordinate Geometry)

5. Formulate a pair of linear equations in two variables "3 pens and 4 books together cost Rs.50 where as 5 pens and 3 books together cost Rs. 54".
6. In a nursery, there are 17 rose plants in the first row, 14 in the second row, 11 in the third row and so on. If there are 2 rose plants in the last row, find how many rows of rose plants are there in the nursery.
7. Find the point on the X-axis which is equidistant from $(2 - 5)$ and $(-2, 9)$.
8. Verify that the points $(1, 5)$, $(2, 3)$ and $(-2, -1)$ are collinear or not?

Section - II

Marks: $4 \times 1 = 4$

Note:

1. Answer any four of the following six questions.
2. Each question carries 1 mark.

9. Determine the value of $\log_3 243$
10. Let $A = \{1, 3, 5, 7\}$, $B = \{1, 2, 3, 4, 6\}$ find $A - B$ and $B - A$.
11. Give any two examples of disjoint sets from your daily life.
12. Find the zeroes of the polynomial $P(y) = y^2 - 1$.
13. Do the irrational numbers $\sqrt{2}$, $\sqrt{8}$, $\sqrt{18}$, $\sqrt{32}$ from an A.P.? If so, find common difference.
14. What do you mean by "slope" of a straight line?

Section - III

Marks: $4 \times 4 = 16$

Note:

1. Answer any four questions, choosing two from each of the following groups, i.e., A and B.
2. Each question carries 4 mark.

Group - A

(Real numbers, Sets, Polynomials, Quadratic Equations)

15. Prove that $\sqrt{3}$ is irrational by the method of contradiction.
16. Let $A = \{x : x \text{ is an even number}\}$
 $B = \{x : x \text{ is an odd number}\}$
 $C = \{x : x \text{ is a prime number}\}$
 $D = \{x : x \text{ is a multiple of 3}\}$
Find (i) $A \cup B$ (ii) $A \cap B$ (iii) $C - D$ (iv) $A \cap C$ and describe the sets in set builder form.
17. Find a quadratic polynomial whose sum of zeroes is $\frac{-3}{2}$ and product is -1 . How many such polynomials you can find in this process?
18. Find the roots of the equation $5x^2 - 6x - 2 = 0$ by the method of completing the square.

Group - B

(Linear Equations in two variables, Progressions and co-ordinate Geometry)

19. Solve the equations $\frac{2}{\sqrt{x}} + \frac{3}{\sqrt{y}} = 2$ and $\frac{4}{\sqrt{x}} - \frac{9}{\sqrt{y}} = -1$.
20. Check whether the given pair of linear equations represent intersecting, parallel or co-incident lines. Find the solution if the equations are consistent.
- (i) $3x + 2y = 5$
 $2x - 3y = 7$
- (ii) $2x - 3y = 5$
 $4x - 6y = 15$
21. The number of bacteria in a certain culture triples every hour. If there were 50 bacteria present in the culture originally, what would be the number of bacteria in 3rd hour? 5th hour? 10th hour? 11th hour?
22. Find the area of triangle formed by the points (8, -5) (-2, -7) and (5, 1) by using Heron's formula.

Section - IV

(Polynomials, Linear Equations in two variables)

Marks: 5 × 2 = 10

Note:

1. Answer any one question from the following.

2. This question carries 5 marks.

23. Draw the graph of $P(x) = x^2 - 6x + 9$ and find zeroes. Verify the zeroes of the polynomial.
24. Solve the pair of linear equations graphically

$$2x - y = 5$$

$$3x + 2y = 11$$

Mathematics - Paper - I
(English Version)
Part A and B

Time: 2½ hours

Max Marks: 50

Part - B

Time: 30 minutes

Marks: 15

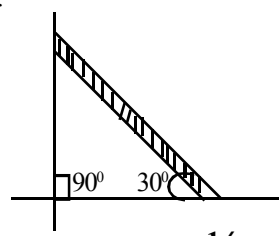
Note:

1. All questions are to be answered.
2. Each question carries ½ mark
3. Answer are to be written in the question paper only.
4. Marks will not be given for over - writing, re-writing or erased answers.

I. Write the Capital letters of the correct answer in the brackets provided against each question. 10× ½ = 5 marks

1. One of the following is an irrational number. ()
A) $\frac{2}{3}$ B) $\sqrt{\frac{16}{25}}$ C) $\sqrt{8}$ D) $\sqrt{0.04}$
2. The product of zeroes of the cubic polynomial $2x^3 - 5x^2 - 14x + 8$ is ()
A) -4 B) 4 C) -7 D) $\frac{5}{2}$
3. A pair of Linear equations which satisfies dependent system ()
A) $2x + y - 5 = 0$; $3x - 2y - 4 = 0$
B) $3x + 4y = 2$; $6x + 8y = 4$
C) $x + 2y = 3$; $2x + 4y = 5$
D) $x + 2y - 30 = 0$; $3x + 6y + 60 = 0$
4. The n term of G.P. is $a_n = ar^{n-1}$ where 'r' represents ()
A) First terms B) Common difference
C) Common ratio D) Radius
5. The number of two digit numbers which are divisible by 3 ()
A) 30 B) 20 C) 29 D) 31
6. The equation of the line which intersects X-axis at (3, 0) is ()
A) $x + 3 = 0$ B) $y + 3 = 0$ C) $x - 3 = 0$ D) $y - 3 = 0$
7. The coordinates of the centre of the circle if the ends of the diameter are (2, -5) and (-2, 9) ()
A) (0, 0) B) (2, -2) C) (-5, 9) D) (0, 2)

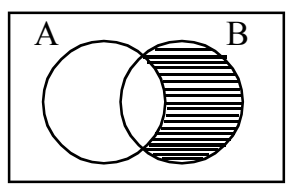
8. The point of intersection of the lines $x = 2014$ and $y = 2015$ is ()
 A) (2015, 2014) B) (2014, 2015) C) (0, 0) D) (1, 1)
9. Which of the following vertices form a triangle ()
 A) (1, 2), (1, 3), (1, 4) B) (5, 1), (6, 1), (7, 1)
 C) (0, 0), (-1, 0), (2, 0) D) (1, 2), (2, 3), (3, 4)
10. The slope of a ladder making an angle 30° with the floor ()
 A) 1 B) $\frac{1}{\sqrt{3}}$ C) $\sqrt{3}$ D) $\frac{1}{2}$



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

II. Fill in the blanks with suitable answers

11. The decimal form of $\frac{23}{2^3 \times 5^2}$ is _____
12. The shaded region in the diagram represents _____



13. If $\frac{1}{3}$ is one zero of $3x^2 + 5x - 2$ then the other zero is _____
14. The value of 'K' for which a pair of linear equations $3x + 4y + 2 = 0$ and $9x + 12y + K = 0$ represent coincident lines is _____
15. The quadratic equation having roots α and β is _____
16. The sum of first 20 odd numbers is _____
17. The distance between the origin to the point $(-4, -5)$ is _____ units.
18. The centroid of the triangle whose vertices are $(3, -5)$, $(-7, 4)$ and $(10, -2)$ is _____
19. The distance between two points (x_1, y_1) and (x_2, y_2) on the line parallel to X-axis is _____
20. The mid point of the line joining the points $(\log_2 8, \log_4 16)$ and $(\sin 90^\circ, \cos 0^\circ)$ is _____

For the following questions under Group-A choose the correct answer from the master list Group-B and write the letter of the correct answer in the brackets provided against each item. 10 × ½ = 5 marks

- | (i) | Group - A | | Group - B |
|-----|--|-----|--------------------------|
| 21. | The logarithmic form of $2^{10} = 1024$ | () | A) $4(\log 5 + \log 2)$ |
| 22. | The Exponential form of $\log_{10}^{0.01}$ | () | B) 0 |
| 23. | The Expansion of $\log 10000$ | () | C) $\log 4$ |
| 24. | The short form of $\log 16 - 2 \log 2$ | () | D) $\log_2^{1024} = 10$ |
| 25. | The value of \log_{1000}^1 | () | E) $\log 8$ |
| | | | F) $\log 1000$ |
| | | | G) -2 |
| | | | H) $\log 125 + \log 800$ |

- | (ii) | Group - A | | Group - B |
|------|---|-----|------------------|
| 26. | Product of zeroes of $x^2 - 3$ | () | I) $\frac{3}{2}$ |
| 27. | Sum of zeroes of $2x^3 - 3x^2 - 14x + 18$ | () | J) 3 |
| 28. | The common root of $2x^2 + x - 6 = 0$ and $x^2 - 3x - 10 = 0$ is | () | K) 0 |
| 29. | The value of the polynomial $p(x) = 3x^2 - 5x - 2$ at $x = 2$ | () | L) 36 |
| 30. | The discriminant of quadratic equation $x^2 - 4x + 5 = 0$ | () | M) -2 |
| | | () | N) -3 |
| | | () | O) -7 |
| | | () | P) -4 |

Mathematics - Paper - II

Moder Paper

Weightage Tables

Table : 1 Weightage to Academic Standards

| S. No. | Academic Standards | Weightage % | Marks |
|--------|--------------------------------|-------------|-----------|
| 1. | Problem Solving | 40 | 32 |
| 2. | Reasoning & Proof | 20 | 16 |
| 3. | Communication | 10 | 8 |
| 4. | Connections | 15 | 12 |
| 5. | Representation & Visualisation | 15 | 11 |
| | Total | 100% | 79 |

Table : 2 Weightage to Areas

| S. No. | Area | Weightage % | Marks |
|--------|--|-------------|-----------|
| 1. | Geometry (i) Similar Triangles (ii) Tangents and Secants to a circle | 27 | 22 |
| 2. | Mensuration | 19 | 15 |
| 3. | Trigonometry (i) Trigonometry (ii) Apps of Trigonometry | 29 | 23 |
| 4. | Statistics (i) Statistics (ii) Probability | 25 | 19 |
| | | 100% | 79 |

Table : 3 Weightage to difficulty level

| S. No. | Type | Weightage % | Marks |
|--------|-----------|-------------|-----------|
| 1 | Easy | 25% | 20 |
| 2 | Average | 50% | 39 |
| 3 | Difficult | 25% | 20 |
| | | 100% | 79 |

Table : 4 Weightage to type of questions

| S. No. | Type of Questions | Weightage % | Marks |
|--------|-------------------|-------------|-----------|
| 1. | Long Answer | 53% | 42 |
| 2. | Short Answer | 20% | 16 |
| 3. | Very Short Answer | 8% | 06 |
| 4 | Objective | 19% | 15 |
| | Total | 100% | 79 |

Blue Print (Paper - II)

| Content Areas | Problem Solving | | | | | Reasoning & Proof | | | | | Communication | | | | | Connection | | | | | Representation | | | | | | | | | | |
|---|------------------|------------------|------------------|-------------------|-----|-------------------|------------------|------------------|------------------|-----|------------------|------------------|------------------|------------------|-----|------------------|------------------|------------------|------------------|-----|------------------|----|-----|------------------|-----|------------------|------------------|------------------|------------------|-----|----|
| | E | SA | VSA | Obj | Tot | E | SA | VSA | Obj | Tot | E | SA | VSA | Obj | Tot | E | SA | VSA | Obj | Tot | E | SA | VSA | Obj | Tot | E | SA | VSA | Obj | Tot | |
| Geometry (Similar Triangles & Circles) | (1) ⁴ | (1) ² | - | (1) ^½ | - | (1) ⁴ | (1) ² | - | (1) ^½ | - | - | - | (1) ^½ | - | - | (1) ⁴ | (1) ² | - | (1) ^½ | - | (1) ⁵ | - | - | (1) ^½ | - | (1) ⁵ | - | - | (1) ^½ | - | 22 |
| Mensuration | (1) ⁴ | (1) ² | (1) ¹ | (1) ^½ | - | (1) ⁴ | - | - | (2) ^½ | - | (1) ⁴ | - | - | (1) ^½ | - | - | (1) ² | - | (1) ^½ | - | - | - | - | - | - | - | - | - | - | 15 | |
| Trigonometry (Trigonometry & Application or Trigonometry) | (1) ⁵ | (1) ² | - | (3) ^½ | - | - | (1) ² | - | (1) ^½ | - | (1) ⁴ | (1) ² | (1) ¹ | (1) ^½ | - | (1) ⁴ | - | - | (4) ^½ | - | - | - | - | (1) ^½ | - | - | - | (1) ^½ | - | 23 | |
| Statistics (Statistics & Probability) | - | (1) ² | (1) ¹ | (2) ^½ | - | (1) ⁴ | - | (1) ¹ | (1) ^½ | - | - | (1) ² | - | (1) ^½ | - | - | - | (1) ¹ | (2) ^½ | - | (1) ⁴ | - | - | (2) ^½ | - | (1) ⁴ | - | - | (2) ^½ | 19 | |
| | (1) ⁵ | (4) ² | (2) ¹ | (10) ^½ | 32 | (2) ⁴ | (2) ² | (1) ¹ | (6) ^½ | 16 | (1) ⁴ | (1) ² | (1) ¹ | (2) ^½ | 08 | (1) ⁴ | (1) ² | (2) ¹ | (8) ^½ | 12 | (1) ⁵ | - | - | (4) ^½ | 11 | (1) ⁵ | (1) ⁴ | (1) ⁴ | 79 | | |

SSC Model Question Paper
Mathematics - Paper - II
(English Version)
Part A and B

Time: 2½ hours

Max Marks: 50

Instructions:

1. Answer 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 answerbook of Part - A
-

Part-A

Section - I

Time: 2 hours

Marks: 35

Note:

1. Answer any five questions choosing atleast two from each of the following two groups i.e., A and B.
2. Each question carries 2 marks.

Group - A

(Similar triangles, Tangents and secants to a circle, mensuration)

1. Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.
2. A Tangent is drawn from a point which is 34 cms away from centre of a circle. If the diameter of the circle is 34 cms, then find the length of the tangent.
3. Find the volume and the total surface area of a hemisphere of radius 3.5 cms.
4. An oil drum is in the shape of a cylinder having the following dimensions: diameter is 2m. and height is 7m. If the painter charges 3 per m². To paint the drum find the charges to be paid to the painter.

Group - B

5. If $\sin \theta = \frac{3}{5}$, find the value of $\sec^2 \theta + \tan^2 \theta$.
6. Ravi is on the top of a 20m high building. Rahim is 20m. away from the bottom of the building, Can Rahim see Ravi at 45° angle? Justify your answer.
7. A bag contains 5 Red and 8 white balls. If a ball is drawn at Random from the bag what is the probability that it will be (i) white ball (ii) not a white ball.
8. Write the formula of median for a grouped data? Explain the symbols in words.

Section - II

Marks: $4 \times 1 = 4$

Note:

1. Answer any four of the following six questions.
2. Each question carries 1 mark.
9. Write the properties of similar triangles.
10. Find the area of required cloth to cover the heap of grain in conical shape, of whose diameter is 8m and slant height of 3m.
11. A die is thrown at once. Find the probability of getting an even prime number.
12. Find the mode of the data 5, 6, 9, 6, 12, 3, 6, 11, 6 and 7.
13. Express $\tan \theta$ in terms of $\sin \theta$.
14. A doctor observed that the pulse rate of 4 students is 72, 3 students is 78 and 2 students is 80. Find the mean of the pulse rate of the above students.

Section - III

Marks: $4 \times 4 = 16$

Note:

1. Answer any four questions, choosing two from each of the following groups, i.e., A and B.
2. Each question carries 4 mark.

Group - A

15. A chord makes a right angle at the centre of a circle having a radius 10 cms. find (i) Area of minor segment (ii) Area of major segment
16. State and prove pythagorus theroem.
17. Metallic spheres of radius 6 cm, 8cm and 10 cm. respectively are melted to form a single solid sphere. Find the radius of the resulting sphere.
18. Find the ratio of surface areas of sphere and cylinder having same radius and height. Comment on the result.

Group - B

19. If $\sec \theta + \tan \theta = P$ then find the value of $\sin \theta$ in terms of 'P'.
20. A boat has to cross a river. It crosses the river by making an angle of 60° with the bank of the river, due to the stream of the river and travels distance of 600 mts., to reach the another side of the river. What is the width of the river?

21. Two dice are rolled simultaneously and counts are added (i) complete the table given below.

| | | | | | | | | | | | |
|--------------------------|----------------|---|---|---|---|---|----------------|---|----|----|----|
| Event (sum of 2 dice) | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Probability | $\frac{1}{36}$ | | | | | | $\frac{5}{36}$ | | | | |

- (ii) A student argues that there are 11 possible outcomes 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12.

Therefore each of them as a probability $\frac{1}{11}$. Do you agree with this argument. Justify your answer.

22. Draw “OGIVE CURVE” of the following frequency distribution table.

| | | | | | | |
|-----------|------|-------|-------|-------|--------|---------|
| Classes | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 | 100-120 |
| Frequency | 9 | 16 | 24 | 15 | 4 | 2 |

Section - IV

Marks: $5 \times 2 = 10$

Note:

1. Answer one question from the following.

2. Each question carries five marks.

23. Construct a triangle of sides 4 cm, 5 cm, and 6 cm. Then construct a triangle similar to it. Whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.
24. The angle of elevation of a jet plane from a point A on the ground is 60° after a flight of 15 seconds, the angle of elevation changes to 30° . If the jet plane is flying at a constant height of $1500\sqrt{3}$ meter, find the speed of a jet plane.

Mathematics - Paper-II
Part - B
(English Version)

Time: 30 min

Max Marks: 15

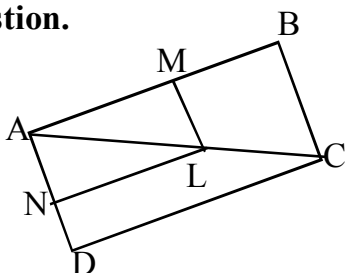
Instructions:

1. The question paper carries $\frac{1}{2}$ mark.
2. Answer are to be written is the question paper only.
3. All questions are to be answered.
4. Marks will not be awarded is case of any over writing or re-writing or erased answers.

Part-B

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

I. Write the capital letters showing the answer in the brackets provided against each question.

1.  from the diagram LM || CB and LN || CD the which () of the following is true.

- A) $\frac{AM}{MB} = \frac{AN}{ND}$ B) $\frac{AN}{ND} = \frac{AM}{AB}$ C) $\frac{AN}{NL} = \frac{AM}{ML}$ D) $\frac{AM}{MB} = \frac{AN}{AD}$

2. The distance between the points $(\cos\theta, 0)$, $(0, \sin\theta)$ ()

- A) 1 B) -1 C) 0 D) $\sqrt{-1}$

3. The A.M. of 30 students is 42. Among them two got zero marks then A.M. of remaining students ()

- A) 40 B) 42 C) 45 D) 28

4. The probability of getting kind or green card from the play cards (1 deek) ()

- A) $\frac{1}{52}$ B) $\frac{1}{13}$ C) 45 D) 28

5. The h indicates in Mode $Z = l + \left(\frac{f - f_0}{2f - f_0 - f_1} \right) \times h$ ()

- A) Frequency B) Length of the CI

C) Lower boundary of mode class D) Mode

6. Which of the following is incorrect ()

- A) The ratio of surface areas of cylinder and core is 1:1
- B) The ratio SA (Surface Area) of sphere and hemisphere is 2:1
- C) The ratio TSA (Total Surface Area) of sphere and hemisphere is 2:1
- D) The ratio of volumes of cylinder and core is 3:1

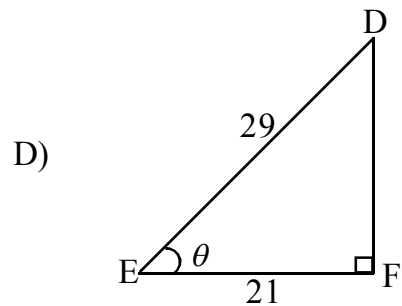
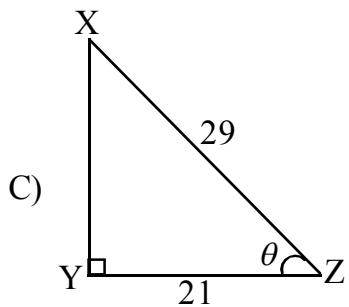
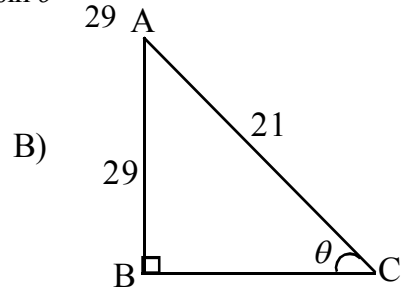
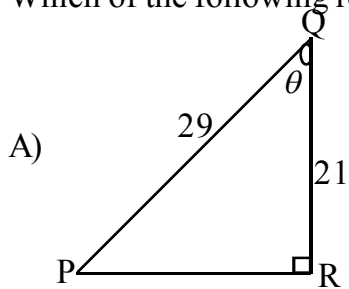
7. $\frac{\cos 23^\circ - \sin 67^\circ}{\tan 26^\circ \cdot \tan 64^\circ} =$ ()

- A) $\sin 90^\circ$ B) $\tan 30^\circ$ C) $\tan 0^\circ$ D) $\cot 30^\circ$

8. Among the numbers 1, 2, 3, 15 the probability of choosing a number which is a multiple of 4 ()

- A) $\frac{4}{15}$ B) $\frac{2}{15}$ C) $\frac{1}{5}$ D) $\frac{3}{5}$

9. Which of the following representations $\sin \theta = \frac{21}{29}$ ()

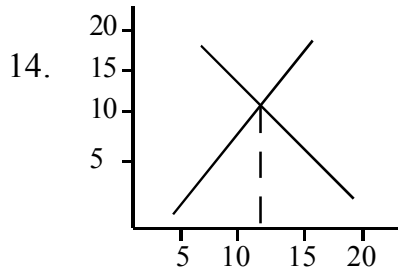


10. Gita said that the probability of impossible events is 1. Pravillika said that probability of sure events is 0 and Atiya said that the probability of any event lies in between 0 and 1. In the above with whom you will agree. ()

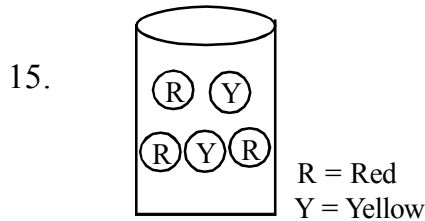
- A) Gita B) Pravillaka C) Atiya D) All the three

II. Fill in the blanks with suitable words.

11. The angle between a tangent to a circle and the radius drawn at the point of contact is _____
12. The ratio between Lateral surface area and total surface area of cube is _____
13. A man goes to East and then to South. The trigonometric ratio involved to find the distance travelled from the starting point is _____



From the figure the possible measures of central tendency can be found is _____



From the figure the probability to get yellow colour ball is _____

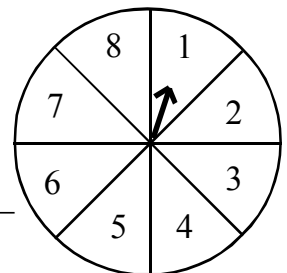
- Ⓡ 16. The Medians of two similar Triangles are 3cm. and 5cm. Then the ratio of areas of above two triangles is _____
17. The area of the base of a cylinder is 616 sq. cm. then its radius is _____
18. The length of the chord making an angle 60° at the centre of the circle having radius 6 cm is _____

19.

| | | | |
|-----------------|----|----|----|
| Marks | 10 | 20 | 30 |
| No. of students | 5 | 9 | 3 |

From the above data the value of median is _____

20. A game of chance consists of spinning an arrow which comes to rest at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 and these are equally likely outcomes. The possibility that the arrow will point at a number greater than 2 is _____



Match the following **$5 \times \frac{1}{2} = 2\frac{1}{2}$ marks****Group - A****Group - B**

21. In triangle ABC, D and E are the points on AB and AC and $\frac{AD}{DC} = \frac{AE}{EC}$ then () A) 20
22. In triangle BED, $\angle E = 90^\circ$ and $ED^2 = BD \cdot CD$ then () B) 4
23. Volume of a hemisphere is 2250 cm^3 than its radius () C) $\frac{77}{3}$
24. The horizontal distance from the foot of the ladder having height 25m touches the window at a height of 15m is () D) 15
25. Two concentric circles of radii 5cm. and 3cm. are drawn. The length of the chord of larger circle touches to small circle () E) $DE \parallel BC$
() F) $DE \perp BC$
() G) 8
() H) $\frac{22}{7}$

Match the following **$5 \times \frac{1}{2} = 2\frac{1}{2}$ marks****Group - A****Group - B**

26. If $\sec \theta + \tan \theta = \frac{1}{2}$ then $\sec \theta - \tan \theta$ value () I) 0
27. $\cos 0^\circ \times \cos 1^\circ \times \cos 2^\circ \times \dots \times \cos 180^\circ$ () J) 1
28. if $\cos A = \frac{4}{5}$ then $\sin A$ value () K) 50°
29. The length of the shadow of a tower of height 15m. at 7A.M. is $15\sqrt{3}$ than the angle made by sun with the earth () L) $\frac{3}{5}$
30. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 80° than $\angle POA$ () M) $\frac{2}{3}$
() N) 60°
() O) 2
() P) $\sqrt{3}$