S.S.C. PUBLIC EXAMINATIONS - MATHEMATICS

WEIGHTAGE TO QUESTION TYPE

S.No.	Type of Question	No. of Questions	Marks Allotted	Percentage
1.	1 Mark Questions	12	12	12%
2.	2 Marks Questions	8	16	16%
3.	4 Marks Questions	8	32	32%
4.	8 Marks Questions	5	40	40%
	Total	33	100	100%

BLUE PRINT

S.No.	Academic Stand	1 M. Q	2 M.Q	4 M.Q	8 M.Q	Total No. of Quetions	Total Marks	Percentage
1.	Problem Solving	6	3	3	2	14	40	40%
2.	Reasoning & Proof	2	1	2	1	6	20	20%
3.	Communication	2	2	1	–	5	10	10%
4.	Connections	1	1	1	1	4	15	15%
5.	Visualisation & Representation	1	1	1	1	4	15	15%
	Total	12	8	8	5	33	100	100%

CHAPTERWISE WEIGHTAGE

S.No.	Academic Stand	1 M. Q	2 M.Q	4 M.Q	8 M.Q	Total Marks
1.	Real Numbers	1	–	–	1	9
2.	Polynomials	2	1	1	–	8
3.	Pair of linear equations	1	–	–	2	9(8)
4.	Quadratic Equations	1	1	1	–	7
5.	Arithmetic Progressions	1	–	1	1	5(8)
6.	Triangles	1	1	–	1	11
7.	Coordinate Geometry	–	1	–	1	2(8)
8.	Introduction to Trigonometry	1	1	1	–	7
9.	Some Applications of Trignometry	1	1	–	1	3(8)
10.	Circles	1	1	1	–	7
11.	Area related to Circles	–	–	–	1	8
12.	Surface areas and Volumes	1	1	1	–	7
13.	Statistics	–	–	1	1	4(8)
14.	Probability	1	–	1	1	13
	Total	12×1=12	8×2=16	8×4=32	5×8=40(40)	100(40)

Within the bracket numbers indicates Internal Choice

SSC PUBLIC EXAMATINATIONS 2024 - 25
MATHEMATICS

(ENGLISH VERSION)

Time : 3 Hours 15 Minutes **Max. Marks : 100**

Instructions :

1. *In the duration of* **3***hours* **15** *minutes,* **15** *minutes of time is allotted to read the question paper.*
2. *All answers shall be written in the answer booklet* ***only****.*
3. *Question paper consists of 4 Sections and* **33** *questions.*
4. *Internal choice is available in section -* ***IV only****.*
5. *Answers shall be written neatly and legibly.*

SECTION - I

12 × 1 = 12 M

Note : i) Answer **all** *the questions in* **one word** *or phrase.*

ii) **Each** *question carries* **1** *mark.*

1. Find the prime factorization of 30.
2. **Assertion :** Sum of the zeroes of a Quadratic polynomial

   $2x^2 + 3x - 4$ is $\frac{-3}{2}$.

   Reason : Sum of the zeroes of a Quadratic polynomial

   $ax^2 + bx + c$ is $\frac{c}{a}$.

   Now, choose the correct answer from the following.

   A) Both Assertion and Reason are true, Reason is supporting the assertion.

   B) Both Assertion and Reason are true but Reason is not supporting the assertion.

   C) Assertion is true, but the Reason is false.

   D) Assertion is false, but the reason is true.

3. The general form of linear equation in two variables is .....
4. If n^{th} terms of an A.P is an = 2n – 6 then

   Match the following.

i) a_2	p) 0
ii) a_3	q) 2
iii) a_4	–2

Choose the correct answer.

A) i – p, ii – r, iii – q

B) i – r, ii – q, iii – p

C) i – r, ii – p, iii – q

D) i – q, ii – r, iii – p

5. **Statement-I :** All similar triangles are congruent.

   Statement-II : All right angled isosceles triangles are similar.

   Now, choose the correct answer.

   A) Both statements are true.

   B) Statement I is true and Statement II is false.

   C) Statement I is false and statement II is true.

   D) Both statements are false.

6. A person standing 20 meters away from the base of a building observes that the angle of elevation to the top of the building is 45° then the height of the building is .....

7. How many tangents can a circle have ?

8. Draw a rough figure of cylinder with height h cm and base radius r cm.

9. If p(E) = 0.05, what is the probability of 'not E' ?

10. Zero of the polynomial of ax + b is ( )

    A) $\frac{b}{a}$ B) $\frac{a}{b}$ C) $\frac{-a}{b}$ D) $\frac{-b}{a}$

11. If 4 cot A = 3 then tan A = ( )

    A) $\frac{3}{5}$ B) $\frac{4}{5}$ C) $\frac{4}{3}$ D) $\frac{3}{4}$

12. If $x = \frac{1}{x}$ then the roots are ( )

    A) 1 B) –1 C) A, B D) None

SECTION - II

8 × 2 = 16 M

Note : *i) Answer* **all** *the questions.*
ii) **Each** *question carries* **2** *marks.*

13. Find the volume of a cylinder with radius of base 6 cm and height 7 cm.
14. Find a Quadratic polynomial whose sum and product of the zeroes are 3 and 2 respectively.
15. Check whether the following are Quadratic Equations or not.

    i) $(x - 2)^2 + 1 = 2x - 3$ ii) $x(x + 1) + 8 = (x + 2)(x - 2)$
16. Give an example for

    i) Similar figures ii) non similar figures
17. Find the coordinates of mid point of the line segment joining (cos 0, 0) and (0, sin 90°)
18. Express the ratios cos A and tan A in terms of sin A.
19. Draw a diagram for the following situation.

    A boy observed the top of an eletric pole at an angle of elevation of 60° when the observation point is 8 meters away from the foot of the pole.
20. Calculate the length of tangent from a point 15 cm. away from the centre of a circle of radius 9 cm.

SECTION - III

8 × 4 = 32 M

Note : *i) Answer* **all** *the questions.*
ii) **Each** *question carries* **4** *marks.*

21. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting

    i) a king of black colour

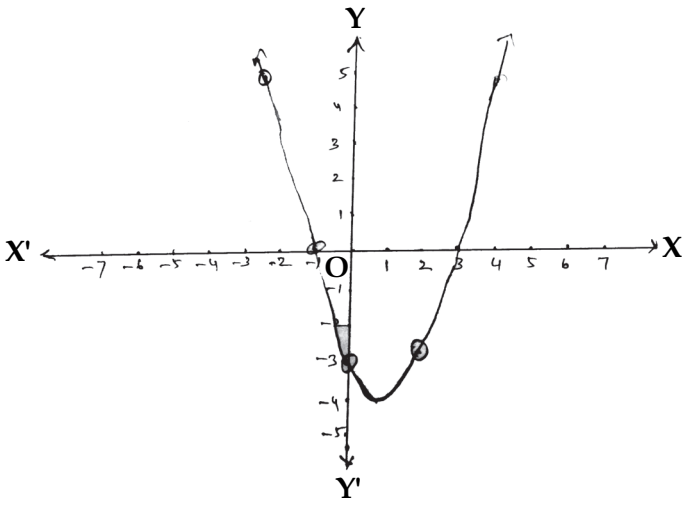
    ii) a red face card.
22. Write the formula to find the mode of a grouped data and explain the terms involved in it.
23. A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1 cm and the height of the cone is equal to its radius. Find the volume of the solid in terms of π.
24. Find two numbers whose sum is 27 and product is 182.

25. Prove that $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\text{cosec}A - 1}{\text{cosec}A + 1}$

26. Find the sum of odd numbers between 0 and 50.

27. Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre.

28. Due to heavy storm an electric wire got bent as shown in the figure. It followed a mathematical shape. Answer the following questions below.



a) Name the shape in which the wire is bent.

b) How many zeroes are there for the polynomial (Shape of the wire)

c) The zeroes of the polynomial are

d) Sum of the zeroes of the polynomial

SECTION - IV **5 × 8 = 40 M**

Note : ***i) Answer* all *the questions.***

ii)* Each *question carries* 8 *marks.

iii) There is an internal choice for each question.

29. a) Prove that $2 + 5\sqrt{3}$ is irrational.

OR

b) Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio.

30. a) Find the area of a rhombus if its vertices are (–4, –7), (–1, 2), (8, 5) and (5, –4) taken in order.

OR

b) A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope. Find

i) the area of that part of the field in which the horse can graze.

ii) the increse in the gazing area if the rope was 10 m log instead of 5 m.

31. a) A box contains 100 discs which are numbered from 1 to 100. If one disc is drawn at random from the box, find the probability that it bears (i) a two-digit number (ii) a perfect square (iii) a number divisible by 5. (iv) a number divisible by 10.

OR

b) The angles of depression of the top and bottom of an 8 m tall building from the top of a multi-storeyed building are 30° and 45° respectively. Find the height of the multi-storeyed building and the distance between the two buildings.

32. a) The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

Weight (in kg)	40 – 45	45 – 50	50 – 55	55 – 60	60 – 65	65 – 70	70 – 75
No. of Students	2	3	8	6	6	3	2

OR

b) If the sum of first 7 terms of an A.P is 49 and that of 17 terms is 289, find the sum of first n terms.

33. a) Solve the following pair of linear equations graphically.

$2x + y - 5 = 0$

$3x - 2y - 4 = 0$

OR

b) Form the pair of linear equations in the following situation and find their solution graphically.

3 pens and 4 pencils together coast ₹ 44 whereas 4 pens and 3 pencils together cost ₹ 47.