S no	Syllabus Covered	Chapters(In Half Yearly)	Marking Scheme
1.	Unit 1 Number System	Real Numbers	7
2.	Unit 2 Algebra	Polynomials Linear Equation In 2 Var. Quadratic Equation Arithmetic Expression	21
3.	Unit 3 Geometry	Similar Triangles	12
4.	Unit 4 Coordinate Geometry	Coordinate Geometry	10
5.	Unit 5 Trigonometry	Intro To Trigonometry	12
6.	Unit 6 Mensuration	Area Related To Circles	8
7.	Unit 7 Stats & Probability	Statistics Probability	10

Note: Students/Teachers can refer to this Sample Paper for practice purpose. However, students may find or experience different exam pattern as syllabus or marking scheme may vary school to school.

MM:80	**GENERAL INSTRUCTIONS**	**TIME:3 Hrs**

READ CAREFULLY ALL INSTRUCTIONS

1. **This Question Paper has 5 Sections A, B, C, D and E.**
2. **Section A has 20 MCQs carrying 1 mark each**
3. **Section B has 5 questions carrying 02 marks each.**
4. **Section C has 6 questions carrying 03 marks each.**
5. **Section D has 4 questions carrying 05 marks each.**
6. **Section E has 3 case based integrated units of assessment (04 marks each) with sub parts of the values of 1, 1 and 2 marks each respectively.**
7. **All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E**
8. **Draw neat figures wherever required. Take π =22/7 wherever required if not stated.**
9. **This paper consists of 38 questions.**
   a. **Write your answers neatly and legibly.**
   b. **Ensure you have not left any question unanswered**

<div align="center">**Section A (1 Marker)**</div>

Q1 A quadratic polynomial whose zeroes are $3 + 2\sqrt{2}$ and $3 - 2\sqrt{2}$ is

   (a) $x^2 - 9x + 1$ **(b)** $x^2 - 6x + 1$ **(c)** $x^2 - 6x + 5$ **(d)** $x^2 + 6x + 1$

Q2 If the equation $x^2 + 4x + k = 0$ has real roots, then

   (a) k< 4   **(b)** k> 4   **(c)** k ≥ 4   **(d)** k ≤ 4

Q3 If $a = 2^2 \times 3^x$, $b = 2^2 \times 3 \times 5$, $c = 2^2 \times 5 \times 7$ and $LCM(a, b, c) = 3780$, the value of x is equal to
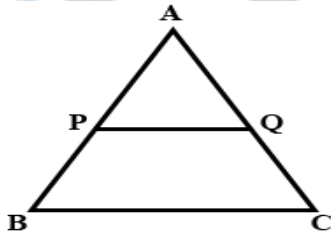
   (a) 1   **(b)** 3   **(c)** 2   **(d)**

Q4 If the system of equations $2x + 3y = 7$; $2ax + (a + b)y = 28$ represent coincident lines, then

   (a) $a = 2b$ **(b)** $b = 2a$ **(c)** $a + 2b = 0$ **(d)** $2a + b = 0$

Q5 The vertices of a rhombus (3,0), (4, 5), (-1, 4) and (-2, -1) are taken in order. Their diagonals will meet at

   (a) (1, 2)   **(b)** (-1, −2)   **(c)** (3, 3)   **(d)** (2, -2)

Q6 In the figure $PQ \parallel BC$, if $\frac{PQ}{BC} = \frac{2}{5}$, then $\frac{AP}{PB}$ is
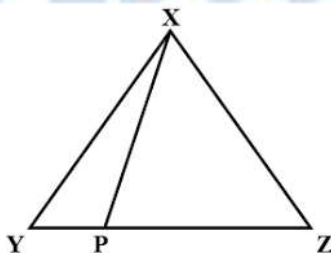

   (a) $\frac{2}{5}$ **(b)** $\frac{5}{2}$ **(c)** $\frac{2}{3}$ **(d)** $\frac{3}{5}$

Q7 If $4\cos^2\theta - 5\sin^2\theta = 5$, then the value of $\sec^2\theta + \tan^2\theta$ is

   (a) $\frac{5}{4}$ **(b)** $\frac{4}{5}$ **(c)** 1   **(d)** 0

Q8 In the given figure $\angle YXZ = \angle XPZ$, then $\frac{ZX}{ZY}$ is equal to

   (a) $ZY \times ZP$ **(b)** XZ^2 **(c)** $\frac{PZ}{XZ}$ **(d)** PZ^2

Q 9 If A and B are acute angles such that $\sin A = \frac{1}{2}$ and $\tan B = \frac{1}{\sqrt{3}}$, then the value of $\cos(A + B)$ is

   (a) $\frac{1}{\sqrt{2}}$ **(b)** $\frac{\sqrt{3}}{2}$ **(c)** 1   **(d)** $\frac{1}{2}$

Q10 On a road, three consecutive traffic lights change after 36, 42 and 72 seconds. If the lights are first switched on at 9:00 am, then at what time will they change simultaneously?

(a) 9:08:04   (b) 9:08:24   (c) 9:08:44   (d) 9:08:

Q11 For the following distribution, the upper limit of the median class is___

CI	0-5	6-11	12-17	18-23	24-29
Frequency	6	20	30	10	20

(a) 12   (b) 11.5   (c) 17   (d) 17.5

Q12 The probability of having 53 Sundays in a leap year is

(a) $\frac{53}{366}$ (b) $\frac{1}{7}$ (c) $\frac{2}{7}$ (d) $\frac{53}{365}$

Q13 A pendulum swings through an angle of 36° and describes an arc 13.2 cm in length. Then, the length of the pendulum is

(a) 21cm   (b) 22cm   (c) 25 cm   (d) 24 cm

Q14 The mode of a distribution is 55 and the modal class is 45-60. The frequency preceding the modal class is 5 and the frequency after the model class is 10, then the frequency of the modal class is

(a) 10   (b) 15   (c) 20   (d) 25

Q15 If $4\cos\theta = 11\sin\theta$, then $\frac{4\cos\theta - 7\sin\theta}{4\cos\theta + 7\sin\theta}$ is

(a) $\frac{5}{18}$ (b) $\frac{1}{36}$ (c) $\frac{2}{9}$ (d) $\frac{9}{2}$

Q16 If the lines given by 3x+2y=2 and 2x+5y+1=0 are parallel, then the value of k is

(a) $\frac{-5}{4}$ (b) $\frac{2}{5}$ (c) $\frac{15}{4}$ (d) $\frac{3}{2}$

Q17 Which of the following never be the probability of an event of any random experiment.

(a) 112%   (b) 7/5   (c) -0.3%   (d) all of these

Q 18 How many three- digit numbers are divisible by 7?

(a) 117   (b) 143   (c) 128   (d) 158

Q19. (Assertion)A: **If the HCF of two numbers is 2 and their product is 120, then their LCM is 60**

(Reason)R: **For any two positive integers p and q, HCF (p, q) x LCM (p q) = p x q**

   (a) Both A and R are true and R is correct explanation of A.
   (b) Both A and R are true but R is NOT the correct explanation of A.
   (c) A is true but R is false.
   (d) A is false and R is true.

Q20 (Assertion)A: **The point on the $X\,axis$ which is equidistant from the points A (- 2, 3) and B (5, 4) is (2, 0)**

(Reason)R: **The coordinates of the point P(x, y) which divides the line segment joining the points A(x_1,y_1) and B(x_2,y_2) in the ratio $m_1:m_2$ is ($\frac{m_1 x_2 + m_2 x_1}{m1+m2}, \frac{m_1 y_2 + m_2 y_1}{m1+m2}$)**

   (a)Both A and R are true and R is correct explanation of A.
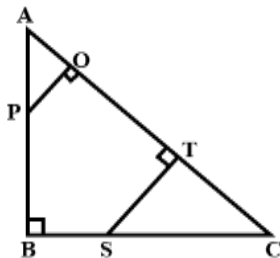   (b)Both A and R are true but R is NOT the correct explanation of A.

(c)A is true but R is false.

(d)A is false and R is true.

Section B(2 Marker)

Q 21 Solve for x and y: $x + y = a + b$
$$ax - by = a^2 - b^2$$

Q22 In the given figure, ΔABC is an isosceles right-angled triangle with ∠B=90° such that PO ⊥ AC, ST ⊥ AC where P lies on AB and S lies on BC. Then prove that ΔAOP ~ ΔCTS

Q23 A chord of length 10 cm divides a circle of radius 5√2 cm in two segments. Find the area of the minor segment. ($\pi = 3.14$)

OR

Three horses are tethered at **3 corners of a triangular** plot having sides 20m, 30 m and 40m with ropes of 7m length each. Find the area of this plot which can be grazed by the horses.

Q24 If sec θ = $\frac{5}{4}$, find the value of $\frac{sin\theta - 2cos\theta}{tan\theta - cot\theta}$

OR

Solve the equation for θ : $\frac{sin^2\theta}{tan^2\theta - sin^2\theta} = 3$

Q25 If the equation $(1 + m^2)x^2 + 2mcx + (c^2 - a^2) = 0$ has equal roots, prove that $c^2 = a^2(1 + m^2)$.

Section C(3 Marker)

Q 26 Given that $\sqrt{3}$ is an irrational number, prove that $\frac{2\sqrt{3}+5}{7}$ is an irrational number.

Q 27 Find the zeros of the polynomial $p(x) = 4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ and verify the relationship between the zeros and its coefficients.

Q28 Students of a class are made to stand in rows. If one student is extra in a row, there would be 2 rows less. If one student is less in a row, there would be 3 rows more. Find the number of students in the class.

OR

800 people collectively paid Rs 67500 for watching a film show occupying the balcony and the rear stall seats. If the charges for the balcony seat and rear stall seat were ₹ 100 and ₹ 75 respectively, how many more audience occupied the rear seats?

Q 29 Prove the following identity.

$$\frac{(1+cotA+\tan A)\ (\sin A - cosA)}{sec^3A - cosec^3\ A} = sin^2Acos^2A$$

OR

Prove that $\dfrac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A = \dfrac{\sin A}{1 - \cos A}$

Q30 A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is (i) either a black card or a queen.

   (ii) neither a red card nor a king.

   (iii) a black card and a king.

Q31.Calculate the area of the minor segment of the circle, made by a chord which subtends a right angle at the center of a circle of radius 10cm.

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Section D(5 Marker)

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Q 32 Some students planned a picnic. The budget for food was ₹ 500. But 5 of them failed to go and   thus the cost of food for each member increased by ₹ 5. How many students attended the picnic? How much did each student pay for the food?

<div style="text-align:center;">OR</div>

   The time taken by a person to cover 150 km was $2\frac{1}{2}$ hours more than the time taken in the return journey. If he returned at a speed of 10 km/hour more than the speed while going, find the speed per hour in each direction.

Q33 The mean of the following frequency distribution is 91. Compute the values of x and y if the sum of the frequency is 150.

Classes	0-30	30-60	60-90	90-120	120-150	150-180
Frequency	12	21	x	52	y	11

Q34 State and Prove Basic Proportionality theorm. In the given figure, CD || LA and DE || AC. Find the length of CL if BE = 4 cm and EC = 2 cm.
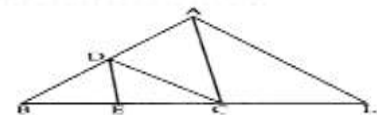
Q35 Find the vertices of the triangle whose mid point of sides are (3,1),(5,6) and (−3,2)

<div style="text-align:center;">

Section E(4 Marker)

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Q36 The sweetened round balls made from flour, sugar and ghee, called as 'Ladoos' are originated in India. One of the widely believed theories is that Sushruta, the ancient Indian physician, first used spherical balls of sesame seeds as an antiseptic to treat his patients. Indian cuisine has a variety of laddu recipes made with unique ingredients and different cooking methods.

   During festival season, a sweet shop made 200 ladoos and arranged them in such way that in the bottom row there are 20 ladoos, 19 in the next row and 18 in the row next to it and so on.

     (i)   How many rows are needed to place all the ladoos?

                      OR

         How many ladoos are placed in the top row?

     (ii)   Find the difference in number of ladoos placed in 7th and 3rd rows.

     (iii)   If sum of nth term of an AP is given by $s_n = 2n^2 + 3n$, then find common difference of an AP.

Q 37. In an examination hall, the students are seated at a distance of 2 m from each other, to maintain the corona virus pandemic. Let three students' seat be at points A, B and C whose coordinates are respectively $A(-5,4), B(-1,-2)$ and $C(5,2)$.

     (i)   What is the distance between A and B?

     (ii)   If the invigilator is at point P, find its coordinates such that it divides the join of B and C in the ratio 1:2.

                      OR

        Find the ratio in which B divides the line segment joining A and C.

     (iii)   Classify the triangle formed by joining the points A, B and C.

Q 38. In NCC and NSS march past of Republic day parade ,members need to be arranged in two groups for march. First group of NCC has 624 members behind band of 32 members. Second group of NSS with 468 members behind the 228 members of bikers in march past.These two groups are to march in the same number of columns. This sequence of soldiers is followed by different states Jhanki which are showing the culture of the respective states.

     (i)   What is the maximum number of columns in which the NCC members can march?

     (ii)   What is the maximum number of columns in which total NCC and NSS members together can march past?

     (iii)   What should be subtracted with the numbers of NSS and the number of bikers so that their maximum number of column is equal to the maximum number of column of NCC ?

                      OR

        What should be added with the numbers of NSS and the number of bikers so that their maximum number of column is equal to the maximum number of column of NCC?