Class – X   Subject – Mathematics   Summative Assessment-I

Time: 3Hours   M.M.80

Section-A

Choose the correct answer and write in your answer sheet $10 \times 1 = 10$

Q.1 $(1 + 3\sqrt{2})(1 - 3\sqrt{2})$ *is*

a.   Positive integer b.   Negative Integer   c.   Irrational No.   d. None

Q.2   Sum of an irrational number and a rational number is always:

a.an irrational   b.a rational   c.an integer   d.a whole number

Q.3   Which one is not polynomial .

a. $x^3 - 3x^2 + x + 1$ b. $\sqrt{5}x^2 + x + 1$ c. $8x^{-2} + x + 1$ d. All are polynomial

Q.4   Value of k for which the system $kx + 2y = 5$, $3x + y = 1$ has unique solution.

a.   k=6   b.   k=3   c. $k \neq 6$ d.   both b & c

Q.5   If *If* $\tan^2 \theta + \dfrac{1}{\tan^2 \theta} = \sqrt{3}$ then value of $\tan^4 \theta + \dfrac{1}{\tan^4 \theta}$ is equal to

a.   3   b.   9   c.   2   d.   none

Q.6   Trigonometric ratio whose value is can not greater than 1

a.   tanA   b.   cosA   c.   sinA   d.   both (b) and (c)

Q.7   Ratio of areas of two similar triangles whose corresponding sides are 8 cm and 12cm is

a. $\dfrac{4}{9}$ b. $\dfrac{6}{9}$ c. $\dfrac{2}{3}$ d. $\dfrac{3}{2}$

Q.8   QA and PB are perpendiculars to AB .If AQ = 10 PB = 6 and AB=9 then PQ is

a.   12   b.   5.4   c.   15   d.   none

Q.9   Remainder when $3x^3 + 16x^2 + 21x + 20$ is divided by x+4

a.   10   c.   -10   c.   0   d.   none

Q.10 $\text{Sec}\,\theta\ (1 - \sin\theta)\ (\sec\theta + \tan\theta)$ equals to

a. $\sec^2\theta + \tan^2\theta$)   b.   1   c.   -1   d.   none

Section-B

Q.11 Consider the number 6^n, Where n is a natural number. Check whether for any value 6^n ends with the digit zero.

Q.12 If α, β are zeroes of quadratic polynomial $kx^2 + 4x + 14$, find the value of k such that

$$(\alpha + \beta)^2 - 2\alpha\beta = 24$$

Q.13 Solve for x and y

$$\frac{x}{a} + \frac{y}{b} = 2, ax - by = a^2 - b^2$$

Q.14 If one diagonal of a trapezium divides the other diagonal in ratio 1:2, Prove that one of the parallel side is double the other.

Q.15 If A,B and C are interior angle of triangle ABC, then show that $\sin\left(\frac{B+C}{2}\right) = \cos\frac{A}{2}$

Q.16 If $7\sin^2\theta + 3\sin^2\theta = 4$, then show that $\tan\theta = \frac{1}{\sqrt{3}}$

Q.17 The following is the distribution of weight(in Kg.) of 40 persons.

Weight(in kg.)	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80
No.of persons	4	4	13	5	6	5	2	1

Construct a cumulative frequency distribution of less than type the above data.

Q.18 The weight of tea in 70 packets are shown in the following table:

Weight(in kg)	200-201	201-202	202-203	203-204	204-205	205-206
No.of persons	12	26	20	9	2	1

Section-C

Q.19 Find the H.C.F. of 65 and 117 and express it in the form of 65m+117n.

Q.20 Find the largest number that will divide 398,436 and 542 leaving remainder 7,11,15,respectively.

Q.21 On dividing $x^3 + x^2 + x - 2$ by a polynomial $g(x)$, the quotient and remainder were $x^2 + 2x + 1$ and $2x - 1$ respectively. Find $g(x)$.

Q.22 α, β are the zeros of the quadratic polynomial $x^2 - (k-1)x + 2(2k-1)$. Find the value of k if

$$\alpha + \beta = \frac{1}{2}\alpha\beta$$

Q.23 Prove that area of equilateral triangle described on the side of a square is half the area of equilateral triangle described on its diagonal.

Q.24 Given $\triangle$ ABC, $\angle A = 90°$,and AD$\perp$ BC ,Prove that AD^2=BD.CD

Q.25 Evaluate:

$$\frac{\sec^2\theta - \cot^2(90-\theta)}{5(\sin^2 52° + \sin^2 38°)} - \frac{3.\cot^2 60°.\csc^2 72°.\cos^2 18°}{\csc^2 54° - \tan^2 36°}$$

Q.26 Prove that:

$$\frac{\cos^3\theta + \sin^3\theta}{\cos\theta + \sin\theta} + \frac{\cos^3\theta - \sin^3\theta}{\cos\theta - \sin\theta} = 2.$$

Q.27 The mean of following distribution is 53. Find the value of p.

Class	0-20	20-40	40-60	60-80	80-100
Frequency	12	15	32	P	13

Q.28 Find the median of following distribution:

Class	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
Frequency	5	6	15	10	5	4	2	2

Section-D

Q.29 Draw the graphs of the pair of linear equation $x - y + 2 = 0; 4x - y - 4 = 0$ .Calculate the area of the triangle formed by the lines so drawn and the $x - axis$.

Q.30 In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides. Prove the converse of it

Using the above proved theorem. $\triangle$ ABC is isosceles triangle with AC=BC. if AB^2=2AC^2. Proved that ABC is a right angled triangle.

Q.31 If α, β are the zeroes of polynomial $2x^2 + 5x = k$ and $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$,find the value of k .

Q.32 If $x = a\sin\theta$ and $y = b\tan\theta$ then Prove that $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$.

OR   Show that $\frac{\cot A + \csc A - 1}{\cot A - \csc A + 1} = \frac{1 + \cos A}{\sin A}$

Q.33 If $\sin A + \csc A = 3$, find the value of $\frac{\sin^4 A + 1}{\sin^2 A}$.

Q.34 Draw the cumulative frequency curve of more than and less than type for the following distribution:

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	5	3	4	3	3	4	7	9	7	8