MAT / 19-20 / I Mathematics (041) Std.: X	SSPM's Sri Sri Ravishankar Vidya Mandir Periodic Assessment – 2	Maximum Marks: 80 Time: 3 Hours Set – 2 Date: 24.09.2019

General Instructions:

- All questions are **compulsory**.
- This question paper consists of **40** questions divided into four **sections A, B, C** and **D**.
- **Section-A** contains **20** questions of **1 mark** each. **Section-B** consists of **6** questions of **2 marks** each. **Section-C** consists of **8** questions of **3 marks** each. **Section-D** consists of **6** questions of **4 marks** each.
- Use of calculator is not permitted.

Section – A

Q.1) A quadratic polynomial, the sum of whose zeroes is 0 and one zero is 3, is _____

a) $x^2 - 9$ b) $x^2 + 9$ c) $x^2 + 3$ d) $x^2 - 3$

Q.2) The value of k for which the system of equations $2x + 3y = 5$ and $4x + ky = 10$ has infinite number of solutions, is _____

a) 1 b) 3 c) 6 d) 0

Q.3) If $y = 1$ is a common root of the equations $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$, then ab equals _____

a) 3 b) $-\frac{7}{2}$ c) 6 d) –3

Q.4) In an equilateral triangle ABC, if AD ⊥ BC, then AD^2 = _____

a) $\frac{5}{4}AB^2$ b) $\frac{3}{4}AB^2$ c) $\frac{4}{4}AB^2$ d) $\frac{2}{4}AB^2$

Q.5) If points $(t, 2t)$, (-2, 6) and (3, 1) are collinear, then t = _____

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

Q.6) One card is drawn from a well shuffled deck of 52 cards. Find the probability of drawing '10' of a black suit.

a) $\frac{1}{26}$ b) 1 c) $\frac{1}{2}$ d) 0

Q.7) If an A. P. is $\frac{3}{2}, \frac{1}{2}, \frac{-1}{2}, \frac{-3}{4}$, ... Then d is _____

a) -1 b) 0 c) 1 d) 2

Q.8) In an isosceles triangle ABC, AB = AC = 25 cm and BC = 14 cm, then altitude from A on BC = _____

a) 20 cm b) 24 cm c) 12 cm d) 42 cm

Q.9) ~~Discriminant~~ Roots of $-x^2 + \frac{1}{2}x + \frac{1}{2} = 0$ is _____

a) $\frac{-1}{2}$, 1 b) $\frac{1}{2}$, 1 c) $\frac{-1}{2}$, -1 d) $\frac{1}{2}$, $\frac{-1}{2}$

Q.10) If α and β are the zeroes of $2x^2 + 5x - 10$, then the value of $\alpha\beta$ is _____

a) $\frac{-5}{2}$ b) 5 c) -5 d) $\frac{2}{5}$

Q.11) Find the nature of the roots for the following quadratic equation: $2x^2 + 5x + 5 = 0$

Q.12) Solve: $2x + y - 3 = 0$, $2x - 3y - 7 = 0$

Q.13) If Δ ABC $\sim$ Δ DEF, BC = 2 cm, EF = 4 cm and A(ΔABC) = 54 cm^2, then find A(ΔDEF).

Q.14) Write the value of λ for which $x^2 + 4x + \lambda = 0$ is a perfect square.

Q.15) Complete the following table: $2x + y - 6 = 0$

x	0	
y		0
(x, y)		

Q.16) Factorise: $a^2x^2 - 3abx + 2b^2 = 0$

Q.17) ABD is a right angled triangle. $\angle$ B = 90^0. AD = 10 cm, BD = 8 cm. Find AB.

Q.18) Find the zeroes of the following quadratic polynomial: $3x^2 - x - 4$

Q.19) Represent the following situation in the form of quadratic equation. The product of two consecutive positive integers is 306. We need to find the integers.

Q.20) Frame the equations for given word problem:

Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu.

Section – B

Q.21) Find the coordinates of the point which divides the line segment joining (-1, 3) and (4, -7) internally in the ratio 3 : 4.

Q.22) The sum of a number and its reciprocal is $2\frac{1}{30}$. Find the number.

Q.23) If α and β are the zeroes of the polynomial $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, find the value of k.

Q.24) Solve the following systems of linear equations:

$4x + \frac{6}{y} = 15$; $6x - \frac{8}{y} = 14$

Q.25) Which term of the arithmetic progression 5, 15, 25, ... will be 130 more than its 31st term?

Q.26) Determine a point which divides a line segment of length 12 cm internally in the ratio 2 : 3.

Section – C

Q.27) A jar contains 54 marbles each of which is blue, green or white. The probability of selecting a blue marble at random from the jar is $\frac{1}{3}$ and the probability of selecting a green marble at random is $\frac{4}{9}$. How many white marbles does the jar contain?

Q.28) Find the sum for given A. P.: $7 + 10\frac{1}{2} + 14 + \ldots\ldots\ldots + 84$

Q.29) If the polynomial $6x^4 + 8x^3 + 17x^2 + 21x + 7$ is divided by another polynomial $3x^2 + 4x + 1$, the remainder comes out to be $ax + b$, find a and b.

Q.30) A man sold a chair and a table together for ₹ 1520 thereby making a profit of 25% on the chair and 10% on table. By selling them together for ₹ 1535 he would have made a profit of 10% on the chair and 25% on the table. Find the cost price of each.

Q.31) Prove: In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

Q.32) Construct a triangle PQR with side QR = 7 cm, PQ = 6 cm and $\angle$ PQR = 60^0. Then construct another triangle whose sides are $\frac{3}{5}$ of the corresponding sides of Δ PQR.

Q.33) Solve the following quadratic equation by factorization method:

$$\frac{4}{x} - 3 = \frac{5}{2x+3}x, \qquad x \neq 0, \frac{-3}{2}$$

Q.34) Solve: $\frac{10}{x+y} + \frac{2}{x-y} = 4$ $\qquad \frac{15}{x+y} - \frac{5}{x-y} = -2$

Section – D

Q.35) In a simultaneous throw of a pair of dice, find the probability of getting:

a) even number on each dice
b) 5 as the sum
c) 2 will come up atleast once
d) a doublet of odd numbers

Q.36) Find the area of the quadrilateral whose vertices taken in order are (-4, -2), (-3, -5), (3, -2) and (2, 3).

Q.37) If the equation $(1 + m^2)x^2 + 2mcx + (c^2 - a^2) = 0$ has equal roots, prove that $c^2 = a^2(1 + m^2)$.

Q.38) Through the mid-point M of the side CD of a parallelogram ABCD, the line BM is drawn intersecting AC in L and AD produced in E. Prove that EL = 2BL.

Q.39) If the m^{th} term of an A. P. is $\frac{1}{n}$ and the n^{th} term is $\frac{1}{m}$, show that the sum of mn terms is $\frac{1}{2}(mn + 1)$.

Q.40) Prove : The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.