Class: X **Subject: Mathematics**

Choose the correct answer (Q. 1 to Q. 10).

Q. 1. Let $x = \frac{p}{q}$ be a rational number, such that the prime factorisation of q is of the form _____, where n, m are non-negative integers. Then x has a decimal expansion which terminates. **[1]**

(a) $2^n \times 3^m$ (b) $2^n \times 5^m$ (c) $3^n \times 5^m$ (d) $2^n \times 7^m$

Q. 2. Polynomials of degree 2 is called _____ polynomial. **[1]**

(a) linear (b) quadratic (c) cubic (d) bi-quadratic

Q. 3. The zeroes of a polynomial $p(x)$ are precisely the _____ of the points, where the graph of $y = p(x)$ intersects the x-axis. **[1]**

(a) origin (b) quadrant (c) x-coordinate (d) y-coordinate

Q. 4. The division algorithm states that given any polynomial $p(x)$ and any non-zero polynomial $g(x)$, there are polynomials $q(x)$ and $r(x)$ such that $p(x) = g(x)\,q(x) + r(x)$, where $r(x) = 0$ or degree of $r(x) <$ _____. **[1]**

(a) degree of $g(x)$ (b) degree of $q(x)$ (c) degree of $p(x)$ (d) 1

Q. 5. The graph of a pair of linear equations in two variables is represented by two lines. If the lines intersect at a point, then that point gives the unique solution of the two equations. In this case, the pair of equations is _____. **[1]**

(a) consistent (b) inconsistent (c) both (d) none of these.

Q. 6. A quadratic equation $ax2 + bx + c = 0$ has two real and equal roots (i.e., coincident roots), if _____. **[1]**

(a) $b^2 - 4ac > 0$ (b) $b^2 - 4ac \geq 0$ (c) $b^2 - 4ac = 0$ (d) $b^2 - 4ac < 0$

Q. 7. An arithmetic progression is a list of numbers in which each term is obtained by adding a fixed number to the preceding term except the first term. This fixed number is called the _____ of the AP. **[1]**

(a) second term (b) third term (c) common difference (d) nth term

Q. 8. The lengths of the two tangents from an external point to a circle are _____. **[1]**

(a) of unit length (b) equal (c) unequal (d) none of these.

Q. 9. The tangent to a circle is _____ to the radius through the point of contact. **[1]**

(a) perpendicular (b) parallel (c) non-perpendicular (d) non-parallel

Q. 10. The probability of an impossible event is _____. **[1]**

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

Do as directed (Q. 11 to Q. 20).

Q. 11. Use Euclid's algorithm to find the HCF of 4052 and 12576. **[2]**

Q. 12. Show that $5 - \sqrt{3}$ is irrational. **[2]**

Q. 13. Find the probability of getting a head when a coin is tossed once. Also, find the probability of getting a tail. **[2]**

Q. 14. Find the HCF and LCM of 6, 72 and 120, using the prime factorisation method. **[3]**

Q. 15. Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients. **[3]**

Q. 16. For what values of k will the following pair of linear equations have infinitely many solutions? **[3]**

$$kx + 3y - (k - 3) = 0$$

$$12x + ky - k = 0.$$

Q. 17. Two dice, one blue and one grey, are thrown at the same time. What is the probability that the sum of the two numbers appearing on the top of the dice is (i) 8? (ii) 13? (iii) less than or equal to 12? **[3]**

Q. 18. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + 3$. **[4]**

Q. 19. Find all the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if you know that two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$. **[4]**

Q. 20. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km down-stream. Determine the speed of the stream and that of the boat in still water. **[4]**