Mathematics-X

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Class-x

MATHEMATICS PAPER

PAPER NO. 1

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Add. Opp. Deep Palace, Rania

Maximum Marks: 80

Time : 3 Hours

General Instructions :

- (i) All questions are compulsory.
- (ii) The questions paper consists of 40 questions divided into four sections A, B, C and D.
- Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
- (iv) There is no overall choice. However, an internal choices have been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
- (v) Use of calculators is not permitted.

| Sr. No. | QUESTIONS | | | | | | |
|------------|--|------------------------------|---------|---------|---|--|--|
| | Q.1-Q.10 are multiple choice questions. Select the most appropriate answer from the given options. | | | | | | |
| 1. | If p_1 and p_2 are two odd prime numbers such that $p_1 > p_2$, then $p_1^2 - p_2^2$ is | | | | | | |
| | (a)an even number | (b)an odd number | | | | | |
| | (c) an odd prime number | er (d)a prime number | | | | | |
| 2. | The points (7, 2) and (−1, 0) lie on a line | | | | | | |
| | (a) $7y = 3x - 7$ | (b) 4 <i>y</i> = <i>x</i> +1 | | | | | |
| | (c) $y = 7x + 7$ | (d) $x = 4y + 1$ | | | | | |
| 3. | If the <i>n</i> th term of an A.P. is given by $a_n=5n-3$, then the sum of first 10 | | | | | | |
| | terms if | | | | 1 | | |
| | (a)225 (b) | 245 | (c) 255 | (d) 270 | _ | | |

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| 4. | Ratio in which the line $3x + 4y = 7$ divides the line segment joining the | | | | | | | |
|-----|---|----------|--|--|--|--|--|--|
| | points (1, 2) and (- 2, 1) is: | | | | | | | |
| | (a)3:5 (b) 4:6 (c) 4:9 (d)none | T | | | | | | |
| 5. | If the surface area of sphere is 616 cm^2 , its radius is: | | | | | | | |
| | (a)14cm (b) 7cm (c)16cm (d) 8cm | 1 | | | | | | |
| 6. | $(\cos^4 A - \sin^4 A)$ is equal to | | | | | | | |
| | (a) $1 - 2\cos^2 A$ (b) $2\sin^2 A - 1$ (c) $\sin^2 A - \cos^2 A$ (d) $2\cos^2 A - 1$ | | | | | | | |
| 7. | What is the next terms of the A.P $\sqrt{8}$, $\sqrt{18}$, $\sqrt{32}$,? | <u>1</u> | | | | | | |
| | (a) $\sqrt{5}$ (b) $\sqrt{55}$ (c) $\sqrt{50}$ (d) $\sqrt{15}$ | | | | | | | |
| 8. | If 18,a,b,-3 are in A.P, then a+b=? | <u>1</u> | | | | | | |
| | (a)7 (b) 11 (c) 15 (d) 9 | | | | | | | |
| 9. | The circumference of a circular field is 528cm . Then its radius is: | <u>1</u> | | | | | | |
| | (a)42cm (b) 56cm (c)72cm (d) 84cm | | | | | | | |
| 10. | The perimeter of the sector with the radius 10.5 cm and the sector angle is | | | | | | | |
| | 60° is : | | | | | | | |
| | (a)11cm (b) 23cm (c)32 (d)41cm | | | | | | | |
| 11. | H.C.F. of 6, 72 and 120 is | <u>1</u> | | | | | | |
| 12. | Degree of remainder is alwaysthan degree of divisor. | <u>1</u> | | | | | | |
| 13. | Length of arc of a sector angle 45° of circle of radius 14cm is | <u>1</u> | | | | | | |
| 14. | The length of the diagonal of a cube that can be inscribed in a sphere of | | | | | | | |
| | radius 7.5 cm is | | | | | | | |
| 15. | A dice is thrown once, the probability of getting a prime number is | <u>1</u> | | | | | | |
| 16. | Find the positive root of $\sqrt{3x^2 + 6} = 9$. | | | | | | | |
| 17. | The diameter of a wheel is 1.26 m. What the distance covered in 500 | <u>1</u> | | | | | | |
| | revolutions. | | | | | | | |
| 18. | A rectangular sheet paper 40 cm ×22 cm is rolled to form a hollow cylinder | <u>1</u> | | | | | | |
| 40 | of height 40 cm. Find the radius of the cylinder | | | | | | | |
| 19. | A cylinder, a cone and a hemisphere have same base and same height. Find | <u>1</u> | | | | | | |
| | the ratio of their volumes. | | | | | | | |

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| 20. | 20 tickets, on which numbers 1 to 20 are written, are mixed thoroughly and | | | | | | |
|-------|---|----------|--|--|--|--|--|
| | then a ticket is drawn at random out of them. Find the probability that the | | | | | | |
| | number on the drawn ticket is a multiple of 3 or 7. | | | | | | |
| | SECTION-B | | | | | | |
| 21. | Solve the following pair of linear equations by cross multiplication method: | | | | | | |
| | x + 2y = 2 and $x - 3y = 7$ | | | | | | |
| 22. | If the point $P(x, y)$ is equidistant from the points $Q(a + b, b - y)$ | | | | | | |
| | a) and $P(a - b, a + b)$ then prove that $bx = ay$. | | | | | | |
| 23. | As a part of a campaign, a huge | <u>2</u> | | | | | |
| | balloon with message of | | | | | | |
| | "AWARENESS OF CANCER" was displayed from the torrace of a tall | | | | | | |
| | building. It was held by string of | | | | | | |
| Aware | length 8 m each which inclined at an | | | | | | |
| 4 | angle of 60c at the point, where it was | | | | | | |
| | tied asshown in the fi gure | | | | | | |
| | (i)What is the length of AB? | | | | | | |
| A | (ii)If the perpendicular distance from | | | | | | |
| | the centre of the circle to the chord AB | | | | | | |
| | is 3 cm, then find the radius of the | | | | | | |
| | circle | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 24. | Find the mean of the data using an empirical formula when it is given that | 2 | | | | | |
| | mode is 50.5 and median in 45.5. | — | | | | | |
| | OR | | | | | | |
| | A bag contains 6 red and 5 blue balls. Find the probability that the ball | | | | | | |
| | drawn is not red | | | | | | |
| 25 | If two possible integers p and g are written as $p = a^2 h^3$ and $a = a^3 h \cdot a h$ | 2 | | | | | |
| 23. | are prime then verify that $ICM(n, q) \times UCE(n, q) = nq$ | <u> </u> | | | | | |
| | are prime then verify that $LCM(p,q) \times HCF(p,q) = pq$ | | | | | | |

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| 26. | Quadratic polynomial $2x^2 - 3x + 1 = 0$.has zeroes as α and β . Now form a | <u>2</u> |
|-----|--|----------|
| | quadratic polynomial whose zeroes are 3α and 3β . | |
| | OR | |
| | If α and β are the zeroes of a quadratic polynomial such that $\alpha + \beta = 24$ and | |
| | $\alpha - \beta = 8$. Find the quadratic polynomial having α and β as its zeroes. | |
| | SECTION-C | |
| 27. | The sum of two digit number is 9 .Also , nine time this number is twice the | <u>3</u> |
| | number obtained by reversing the order of the digits .Find the numbers. | |
| 28. | Find the 20^{th} term of an A.P. whose 3^{rd} term is 7 and the seventh term | 3 |
| | exceeds three times the 3^{rd} term by 2. Also find its <i>nth</i> term a_n . | _ |
| | | |
| | OR | |
| | $2n^2$ 12n | |
| | In an A.P. the sum of first <i>n</i> terms is $\frac{3n}{2} + \frac{13n}{2}$. Find 25 th term. | |
| 29. | $\tan \theta = \cot \theta$ | <u>3</u> |
| | $\frac{1-\cot\theta}{1-\tan\theta} + \frac{1-\tan\theta}{1-\tan\theta} = 1 + \sec\theta \csc\theta$ | |
| 30. | A box contains 90 discs which are numbered from 1 to 90. If one disc is | <u>3</u> |
| | drawn at random from the box, find the probability that bears (i) a two- | |
| | digit number (ii) a perfect square (iii) a number is divisible by 5. | |
| 31. | Prove that the area of an equilateral triangle described on one side of a | 3 |
| | square is equal to half the area of the equilateral triangle described on one | _ |
| | side of its diagonals. | |
| 32. | Construct a $\triangle ABC$ in which $AB=4$ cm, $BC=5$ cm and $AC=6$ cm. Then | <u>3</u> |
| | construct another triangle whose sides are $\frac{7}{2}$ times the corresponding | |
| | sides of ABC . | |
| | OR | |
| | Draw a circle of radius 5 cm. Draw a pair of tangents to this circle, which | |
| | are inclined to each other at an angle of 60°. | |
| 33. | A farmer connects a pipe of internal diameter 20 cm form a canal into a | 3 |
| | cylindrical tank in her field, which is 10m in diameter and 2m deep. If | - |

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| | water flows through the pipe at the rate of 3km/h, in how much time will the tank be filled? | | | | | | | | | | |
|-----|---|----------------------------|--------------------------------|-------|---------|----------|---------------|----------|-----|--------|----------|
| 34. | Prove that $\sqrt{3}$ is an irrational number and hence prove the | | | | | | | <u>3</u> | | | |
| | $7+2\sqrt{3}$ is an irrational number. | | | | | | | | | | |
| | SECTION-D | | | | | | | | | | |
| 35. | State and prove Thales Theorem. | | | | | | <u>4</u> | | | | |
| | State and prove Pythagoras Theorem. | | | | | | | | | | |
| 36. | Prove that the parallelogram circumscribing is a rhombus. | | | | | | | 4 | | | |
| 37. | Find the area shaded region. | | | | | | | <u>4</u> | | | |
| 38. | From the top of tower, 100 m high, a man observes two cars on the | | | | | | | <u>4</u> | | | |
| | opposite sides of the tower with the angles of depression 30° & | | | | | | | | | | |
| | 45° respectively. Find the distance between the cars. | | | | | | | | | | |
| 39. | The following distribution gives the weights of 60 students of a class. Find the mean and mode weights of the students. | | | | | | | <u>4</u> | | | |
| | Veight 40-44 | 6 | 48-52 | 52-: | 56 1 | 56-60 | 60-64 o | 64- | -68 | 08-72 | |
| | <u> </u> | 0 | 10 | | + | 10 | 0 | Ċ |) | Z | |
| | Change the distribution in 'less than type ' ogive: | | | | | | | | | | |
| | Weight 0-10 10-2 | | 10-2 | 0 2 | | 0-30 | 30-40 | | 4 | 10-50 | |
| | Siucenis | 14 | 17 | | | 22 | 20 | | | ١٥ | |
| 40. | Solve $x: \frac{1}{a+b+x} =$ | $=\frac{1}{a}+\frac{1}{b}$ | $\frac{1}{y} + \frac{1}{x}, x$ | (≠ (| 0, a | . ≠ 0, b | ≠ 0, <i>x</i> | ≠ - | -(a | (+ b). | <u>4</u> |

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