** SINDHI HIGH SCHOOL, BANGALURU**

**I PRE-BOARD EXAMINATION (2023-24)**

**SUBJECT – Mathematic Standard (041)**

**Set - 1**

**Class: X Marks: 80**

**Date: 11/12/2023 Reading Time: 8:30 to 8:45 am Number of printed sides: 6 Writing Time: 8:45 to 11:45 am**

**GENERAL INSTRUCTIONS:**

* This Question Paper has 5 Sections A, B, C, D and E.
* Section A has 20 MCQs carrying 1 mark each
* Section B has 5 questions carrying 02 marks each
* Section C has 6 questions carrying 03 marks each.
* Section D has 4 questions carrying 05 marks each.
* 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.
* 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.
* Draw neat figures wherever required. Take π =22/7 wherever required.

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|  | **Section A** |  |
|  | **Section A consists of 20 questions of 1 mark each.** |  |
| 1 | The difference of two natural numbers is 900 and their HCF is 180. The possible number of such pair of natural numbers is  a)5 b)3 c)8 d) infinite | **1** |
| 2 | Which of the following is true if the polynomial ax2+bx+c has distinct rational roots  a) – 4ac 0 b) – 4ac 0  c) – 4ac, a perfect square d) – 4ac=0 | **1** |
| 3 | For what value of c does the pair of equations cx-y=3 and 6x-2y=4 have infinitely many solutions:  a)c=3 b)c = -3  c) c = -12 d) Not possible for any value of c | **1** |
| 4 | If , and are zeroes of the polynomial x2-2x +8 then the value of  a) b) 2 c) 2 d)0 | **1** |
| 5 | The value of …………upto n terms  b)2n(n+1) c) d) | **1** |
| 6 | The value of x if the midpoint of the line joining points (4,x) and (6,3) is (5,1)  a)3 b) -1 c)0 d)0 | **1** |
| 7 | The points A(5,2) and D are such that AD is the median in the triangle ABC. The ratio in which centroid G divides the median is  a)1:2 b) 2:1 c)3:2 d)2:3 | **1** |
| 8 | In the triangle ABC DEBC, if = and AC=18cm then  a)6.3cm b)7.2cm c)6.5cm d) 7.6cm | **1** |
| 9 | The radius of circle inscribed in an equilateral triangle of perimeter 72units is  a) 16 units b) 6 units c) 32 d) 4units | **1** |
| 10 | At one end ‘A’ of a diameter AB of a circle of radius 5cm, a tangent is drawn. If CD is a chord parallel to this tangent and at a distance 8cm from the tangent then length of CD is  a)4cm b)5cm c)6cm d)8cm | **1** |
| 11 | If sin=cos then value of is  a)300 b)450 c) 00 d)900 | **1** |
| 12 | If x=3 , y=3 +1 then x+y  a)3 b)4 c)5 d) -3 | **1** |
| 13 | If the points A(4,3) and B(x,5) are on the circle with centre O(2,3) then the value of x is  a)5 b)6 c)2 d)4 | **1** |
| 14 | The area of the segment of a circle of radius ‘r’ corresponding to a chord AB which subtends an angle of 600 at the centre is  a) b)    c) d) | **1** |
| 15 | A piece of wire 20cm long is bent into the form of an arc of a circle subtending an angle of 600 at its centre. The radius of the circle is  a)cm b)cm c) cm d) cm | **1** |
| 16 | One vowel is from the letters of English alphabet is chosen. The probability that it is a vowel from the word ‘MIRACLE’.  a)1 b) c) d) | **1** |
| 17 | The probability of selecting a marble randomly from a basket containing 1000 marbles is 0.97. the number of marbles in the basket is  a)97 b)970 c) 1000 d) 800 | **1** |
| 18 | The cumulative frequency of the class 40-50 in the following distribution is   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Wt(kg) | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | People | 25 | 40 | 50 | 56 | 80 | 92 | 100 |   a)80 b)56 c)44 d)50 | **1** |
| 19 | In question 19 and 20 a statement of assertion(A) is followed by a statement of reason(R) . Choose the correct option.  Assertion(A) : If the radius of the cone is halved and volume is not changed, then height remains same.  Reason (R) : If the radius of a cone is halved and volume is not changed then height must become four times of the original height.  a)Both assertion (A) and reason (R) are true and reason R is the correct explanation of assertion A  b) Both assertion (A) and reason(R) are true but reason R is not the correct explanation of assertion A.  c) Assertion A is true but reason R is false.  d)Assertion a is false but reason R is true. | **1** |
| 20 | Assertion(A): If the nth term of an AP is 7-4n , then its common difference is -4  Reason (R ): The common difference of an AP is d= -  a)Both assertion (A) and reason (R) are true and reason R is the correct explanation of assertion A  b) Both assertion (A) and reason(R) are true but reason R is not the correct explanation of assertion A.  c) Assertion A is true but reason R is false.  d) Assertion a is false but reason R is true. | **1** |
|  | **SECTION-B** |  |
|  | **Section B consists of 5 questions of 2 marks each** |  |
| 21 | Prove that is an irrational number. | **2** |
| 22 | ABC DEF is such that AB=5.1cm and DE=13.6cm. If perimeter of DEF=64cm then find the perimeter of ABC. | **2** |
| 23 | In the given figure O is the centre of circle and LN is a diameter. If PQ is a tangent to the circle at K and KLN = 300, find PKL. | **2** |
| 24 | Prove that : = .  OR  Evaluate + | **2** |
| 25 | The large hand of a clock is 42cm long. How many centimeters does its extremity move in 20 minutes.  **OR**  Two circles of radii and ( touch each other internally. Distance between their center is 7cm. Find the difference between their circumferences. | **2** |
|  | **SECTION-C** |  |
|  | **Section C consists of 6 questions of 3 marks each** |  |
| 26 | Tamanna is arranging black marbles in groups of 13 and purple marbles in groups of 25. If she has the same number of black and purple marbles, what is the smallest number of marbles of each colour that she could have? Also find the total number of groups in each case. | **3** |
| 27 | If and are zeroes of the polynomial p(x) =x2+3x +k such that = 7, find the value of k. | **3** |
| 28 | Solve for x and y  px +qy =1 ; qx+py=1  **OR**  A person invested some amount at the rate of 12% simple interest and some other amount at the rate of 10% simple interest. He received an yearly interest of ₹130. If he had interchanged the amounts invested, he would have received ₹4 more as interest. How much amount did he invest at different rates. | **3** |
| 29 | In the given figure ,O is the centre of the circle and TP is the tangent to the circle from an external point T. If PBT =300 ,prove that BA: AT = 2:1 | **3** |
| 30 | Prove that + = secA.CosecA +CotA | **3** |
| 31 | The mean of the following data is 65.6. Find missing frequency if sum of frequency is 50   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Class | 10-30 | 30-50 | 50-70 | 70-90 | 90-110 | 110-130 | | Frequency | 5 | 8 |  | 20 |  | 2 |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | **3** |
|  | **SECTION-D** |  |
|  | **Section D consists of 4 questions of 5 marks each** |  |
| 32 | In a flight of 2800km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 100km/hr and time increased by 30minutes. Find the original duration of flight.  **OR**  A person on tour has ₹360 for his daily expenses. If he exceeds his tour by 4 days, he must cut down his daily expenses by ₹3 per day. Find the number days of his tour programme. | **5** |
| 33 | Prove that if line drawn parallel to one side of a triangle to intersect other two sides in distinct points, the other two sides is divided in the same ratio.  ABCD is a trapezium in which AB CD and its diagonals intersect each other at point O. Show that = | **5** |
| 34 | Find the volume of the recycled material used in making the solid as shown in figure. It is given that diameter of cylinder is 20cm and diameter of two equal conical cavities is 10cm.  **OR**  A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of the hemisphere is 3.5cm and the total wood used in the making of the toy is 166 cm3. Find the height of the toy. Also find the cost of painting hemispherical part of the toy at the rate of ₹10 per cm2. (Use =22/7) | **5** |
| 35 | Find mean median and mode of the following data   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Classes | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 | 100-120 | | Frequency | 20 | 35 | 52 | 44 | 38 | 31 | | **5** |
|  | **SECTION-E** |  |
|  | **Section E consists of 3 case study based questions.** |  |
| 36 | Amit was playing the number card game. In the game some cards (having both positive and negative numbers) are arranged in a row such that they are following an Arithmetic progression. On his first turn Amit picks up 6th and 14th card finds their sum to be -76. On the second turn he picks up 8th and 16th card and finds their sum to be -96.  Based on the above information , answer the following questions  i)Find the numbers on the 10th and 12th card.  ii) Find the common difference.  iii)Which card bears greatest negative number?  **OR**  Suppose there are total of 51 cards, find the middle most card. | **4** |
| 37 | In GPS ,the lines that run east- west are known as lines of latitude and the lines running north- south are known as longitude. The latitude and the longitude of a place are its coordinates and the distance formula is used to find the distance between two places. The distance between two parallel lines is approximately 150 km. A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri(P) via Bhuj (B) and Nashik (N) as shown in the given  figure.    i)Find the distance between Lucknow(L) and Bhuj(B)  ii) If Kota(K) internally divides the line joining Lucknow(L) to Bhuj(B) into 3:2 then find the coordinates of Kota(K)  iii)Name the type of triangle formed by the places Lucknow(L) , Nashik(N) and Puri(P)  **OR**  Find a place on the longitude y-axis which is equidistant from the points Lucknow (L) and Puri(P) |  |
| 38 | Gadisar Lake is located in the Jaisalmer district of Rajasthan. It was built by the King of Jaisalmer and rebuilt by Gadsi Singh in 14th century. The lake has many Chhatris. One of them is shown below :  Observe the picture. From a point A ‘h’ m above from water level, the angle of elevation of top of Chhatri (point B) is 450 and angle of depression of its reflection in water (point C) is 600 . If the height of Chhatri above water level is (approximately) 10 m, then  i)Draw a well labelled figure based on the above information.  ii) Find the distance between the points B and C  iii) Find the height (h) of the point A above water level. (Use = 1·73)  **OR**  Find the distance between the point A and C | **4** |

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