

**SINDHI HIGH SCHOOL, BENGALURU**

**HALF YEARLY EXAMINATION [2023-24]**

**SUBJECT: MATHEMATICS**

**Class: X Max Marks: 80**

**Date:19/09/2023 Duration : 3hrs 15 mins**

**No. of Sides:05 Reading Time: 15 mins**

**Writing Time: 3 hrs**

**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 if not stated.

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|  | **Section A** |  |
|  | **Section A consists of 20 questions of 1 mark each.** |  |
| 1 | LCM of ( a + b )2 and ( a2 - b2 ) is  a) (a2 - b2)(a+ b) b)a + b    c) ( a + b )2  (a – b) d)   a - b | **1** |
| 2 | If A= 2n + 11 and B =  n + 6 , then HCF( A,B ) is   1. 11        b) 2       c) 1           d) 6 | **1** |
| 3 | If one zero of the quadratic polynomial 2x2 6kx + 6 x 7 is negative of other, then K is equal to  a)-1     b)1     c)0           d) - 1 / 2 | **1** |
| 4 | The parabola y = x2 - x - 6 crosses x axis at ( 3,0)  and ( -2, 0).  Which of the following parabola also passes through ( 3,0)  and ( -2, 0) ?   1. y =  x2 + x + 6      b) y= 2x2 + 7x + 8   c)  y= 2x2 -  2x - 12    d) y= x2 - 5 x + 10 | **1** |
| 5 | The angle between the lines y + 5=0  and x + 3= 0 is   1. 00    b) 900       c) 1800    d) 600 | **1** |
| 6 | If the lines x + y =7,  xy=  5 and x + my= 3 meet at a point, then the value of m  is  a)-3 b) 3 c) 6 d) 5 | **1** |
| 7 | Triangles ABC  and PQR are similar such that which of the following is correct?  a) b) c) d) | **1** |
| 8 | If in ABC , AB= 6cm and DE BC, such that AE= AC, then the length of AD is  a)2cm    b)  1.2cm   c) 1.5cm   d) 4cm | **1** |
| 9 | If sin + cos =1  , Where     is an acute angle then      is  a)00      b)900    c) 00 or 900    d) 450 | **1** |
| 10 | The ratio by which the line joining points ( - 3, 2) and ( 6, 1) is divided by  y -axis is  a)1:3     b) 1:2    c) 2 :1     d) 3:1 | **1** |
| 11 | Expression of cot in terms of cos    is  a) b) c) d) | **1** |
| 12 | The foot of  perpendicular from P (  - 4,  - 5) to x axis  a) (- 5,0)    b)( -4 ,0)     c)(0,5)     d) ( 5, 0) | **1** |
| 13 | The radius of circle whose diameter has end points ( - 2,3)  and (4, 5) is  a)10 units  b)5 units       c)10 units       d)10 units | **1** |
| 14 | The reciprocal of cosec - cot  Is  b) sin-cot c) sincot d) cosec + cot | **1** |
| 15 | The mean of 5 scores is 15 .When each score is increased by 2, the mean becomes  a)17      b) 7   c)  8      d) 75 | **1** |
| 16 | The circle in the first quadrant touches both  axes . If radius of circle is 3 units the centre of the circle is,  a)(3,0)      b) ( -2,3)   c) ( 3,3)   d)  (0 , 3) | **1** |
| 17 | Find the cumulative frequency of median class in the below distribution is   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | CI | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | | frequency | 8 | 2 | 10 | 9 | 5 | 8 |   a)20      b) 15           c)   9        d) 2 | **1** |
| 18 | Two cards of Hearts and four cards of Spades are missing from a pack of 52 cards. What is the probability of getting a black card from the remaining pack  b) c) d) . | **1** |
| 19 | **Assertion(A):**  P is a point on the circle. There is one and only one tangent to the  circle at P.  **Reason( R):** P Is appoint on circle centred at O.  There are in finite lines through P but only one line has OP as perpendicular .  a)Both Assertion(A) and Reason (R) are true and  Reason( R)  is the correct explanation of (A)  b)Both Assertion(A) and Reason (R) are true and  Reason( R)  is not the correct explanation of (A)  c)Assertion(A)  is true and  Reason( R)  is false  d)Assertion(A)  is  false and  Reason( R)  is true | **1** |
| 20 | **Assertion(A):**  A cube has 6 numbers 1, 7, 8, 9, 11 and 12 on its faces. The sum of probabilities of events getting “1” “7” “8” “ 9” “ 11” and “ 12” is 1  **Reason( R):** E is an event of an experiment 0 P(E) 1  a)Both Assertion(A) and Reason (R) are true and  Reason( R)  is the correct explanation of (A)  b)Both Assertion(A) and Reason (R) are true and  Reason( R)  is not the correct explanation of (A)  c)Assertion(A)  is true and  Reason( R)  is false  d)Assertion(A)  is  false and  Reason( R)  is true | **1** |
|  | **SECTION-B** |  |
|  | **Section B consists of 5 questions of 2 marks each** |  |
| 21 | Find the zeros of x2 12 x + 35 and also  verify the relation between zeros and coefficients. | **2** |
| 22 | If sin A and cos A are the roots of ax2 + bx + c then show that a2 + 2ac =b2 | **2** |
| 23 | Find x, if x sin 300 + =  cos 600  **OR**  In the given figure, ABC is a right angled triangle and BD= 3DC , show that | **2** |
| 24 | Find the smallest number which when divided by 28 and 32 and leaves reminder 8 and 12 respectively  **OR**   Find the largest number which divides 615 and 963 leaving reminder 6 in each case. | **2** |
| 25 | X is a point on the side  B C of triangle  ABC. XM and XN are drawn parallel to AB and AC respectively meeting AB at N  and AC  at M. MN Produced to meet BC at T .  prove that  TX2 =TB TC | **2** |
|  | **SECTION-C** |  |
|  | **Section C consists of 6 questions of 3 marks each** |  |
| 26 | Find LCM and HCF of the numbers 336 and 54 by Fundamental theorem of Arithmetic. Also verify LCM  X   HCF=  product of numbers | **3** |
| 27 | If( K + 1)x  +  2 y + 8=0  and 6x + 4y + 5=0  are inconsistent pair of linear equations in two variables, find k.  Name the graphical representation of these pair of linear equations.  **OR**   Represent Y= 3 and Y = X graphically. Mark point of  intersection of these lines on the graph | **3** |
| 28 | In triangle  ABC, D is a point on  AB.  ACB =CDA . If AC= 8cm  and AD =3cm  find BD.  **OR**  In The given figure CEF =CFE. F is the midpoint of DC. Prove that | **3** |
| 29 | Prove that  “If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio” | **3** |
| 30 | Median value of below distribution is 46 and total number of items is 230 find the missing frequency x and y   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Variable | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | | Frequency | 12 | 30 | x | 65 | y | 25 | 18 | | **3** |
| 31 | Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre  **OR**   Prove that the parallelogram circumscribing a circle is a rhombus | **3** |
|  | **SECTION-D** |  |
|  | **Section D consists of 4 questions of 5 marks each** |  |
| 32 | If in a rectangle, the length is increased and the breadth is reduced each by 2 units, the area gets reduced by 28 square units. If however the length is reduced by 1 and breadth is increased by 2 units the area increases by 33 sq.units. Find the area of rectangle.  **OR**  A  two digit number is such that the product of its digits is 24. If 18 is subtracted from the number ,the digits  interchange  their places . Find the number. | **5** |
| 33 | If + and + , then prove  that OR  If sin-cos= then find | **5** |
| 34 | The points( 3,3) ( 7,5 ) and( 2 ,5)   are midpoints of sides AB,  BC and CA  respectively of triangle ABC. Find the coordinates of vertices A, B and C. | **5** |
| 35 | Using step deviation  method, calculate mean marks of the following distribution. Also find MODE of distribution .   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | CI | 50-55 | 55-60 | 60-65 | 65-70 | 70-75 | 75-80 | 80-85 | 85-90 | | F | 5 | 20 | 10 | 10 | 9 | 6 | 12 | 8 | | **5** |
|  | **SECTION-E** |  |
|  | **Section E consists of 3 case study based questions.** |  |
| 36 | The **chakra** represents more than just spinning wheel. It embodies the spirit of.  India's fight for freedom and principles of non-violent resistance advocated by Mahatma Gandhi as a symbol of self -sufficiency. It continues to inspire individuals and moments worldwide, reminding of the enduring power of simplicity and peaceful protest in the pursuit of justice and freedom.  oO  O  O  O  R        (i)Write the measure of angle between tangent PR and radius OP. Justify( 1M)  (ii) If OP = 8units OR = 10units then find the length of tangents. ( 2Marks)  (iii) Calculate the perimeter of Quadrilateral OPRQ . ( 1 Mark) | **4** |
| 37 | Rahul and Ravi planned to play business( board game )in which they are supposed to use 2 dice.  **Answer the following**.  i)Ravi got first chance to roll the dice. What is the probability that he got the sum of two numbers appearing on the top face of dice is 8?. Write the outcomes of this event.(2marks)  ii)Rahul got next chance, what is the probability that he got the sum of the two numbers appearing on the top face of the dice is 13?(1marks)  iii)Write the number of event “ equal number on both dice “(1marks) | **4** |
| 38 | Anmol is driving his car on a straight road from his office to Noida and then to Delhi. At some point in between Noida and Delhi he suddenly realizes that there is not enough petrol for the journey. Also there is no petrol pump on the road between 2 cities.    i)Calculate the value of x. (1mark)  ii)Write the coordinates of Noida (1mark)  iii)Suppose a petrol pump is built exactly half way between the line segment PQ , find the coordinates of petrol pump.(2marks) | **4** |

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