

** SINDHI HIGH SCHOOL, BENGALURU**

**PRE BOARD EXAMINATION [2023-24]**

**SUBJECT: MATHEMATICS BASIC (241)**

**Class: X SET -2 Max Marks: 80**

**Date:23/01/2024 Reading Time:8:30- 8:45am**

**No of Sides:06 Writing Time:8:45-11:45am**

**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 respectively.
* 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. An internal choice has been provided in the 2marks questions of Section E.
* Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

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| --- | --- | --- |
|  | **Section A** |  |
|  | **Section A consists of 20questions of 1 mark each.** |  |
| 1 | The ratio between LCM and HCF of 5,15,20 is  a)9:1     b)4:3   c)11:1 d)12:1 | **1** |
| 2 | The HCF of smallest prime number and smallest odd composite number is  a)18     b)2 c)9 d)1 | **1** |
| 3 | If one of the zeros of the quadratic polynomial x2 +( a+1) x – 5 is 1 , then the value of a is  a)2    b)3 c)-3 d)1 | **1** |
| 4 | The pair of equations x+2y +5 =0 and -3x -6y +1=0 have  a ) Unique solution b)Exactly two solutions  c) Infinitely many solutions d)No solution | **1** |
| 5 | The nature of the roots in quadratic equation x2 – x +2=0 is  a)Real and equal b)Real and distinct  c)Real and only irrational d)No real roots | **1** |
| 6 | The distance of the pointP (2,3) from the x axis is  a)2    b)3 c)1 d)5 | **1** |
| 7 | If  , then which of the following are not true  a) BC X EF = DF X AC b) AB X EF = ED X AC  c) BC X DE = AB X EF d) BC X DE = AB X FD | **1** |
| 8 | If ABC and DEF are similar triangles such that 0 , and 830, then is equal to  a)500   b)400 c)600 d)900 | **1** |
| 9 | The length of a tangent from a point A, at a distance 25 cm from the centre of the Circle is 24 cm. The radius of the circle is  a)7   b)4 c)5 d)9 | **1** |
| 10 | If 2sinA = 1 , then the value of 2 cotA is  a)  b) c) d) | **1** |
| 11 | If the length of the shadow of a tower is increasing then the angle of elevation of the sun is  a)Increasing b)Decreasing  c)Remain same d)Gets doubled | **1** |
| 12 | 4tan2A -4 sec2 A is equal to  a)-4  b)4 c)0 d)2 | **1** |
| 13 | If the sum of circumference and radius of a circle is 51 cm ,then the radius of the circle is  a)7   b)14 c)21 d) | **1** |
| 14 | The area of the ring of external radius’ R ‘and its internal radius ‘ r ‘is .  a) Π (R2+r2) b) Π (R2 - r2) c) Π (R +r) d) Π (r - R) | **1** |
| 15 | A child has a dice whose 6 faces show the number as given below 1,2,2,3,4,6. The dice is thrown once. The probability of getting the number 5 is    b) c) 0 d)1 | **1** |
| 16 | The mode and mean of a data are 12k and 15 k respectively. The median of the data is  a)12k   b)21k c)14k d)16k | **1** |
| 17 | The ratio of volume of a cube to that of a sphere which will fit inside the cube is  a)4 : Π b)5: Π c)6: Π d)2: Π | **1** |
| 18 | The lower limit of the modal class is   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | CI | 65- 85 | 85 - 105 | 105 - 125 | 125 - 145 | 145 - 165 | 165-185 | 185 -205 | | Frequency | 4 | 5 | 13 | 20 | 14 | 7 | 4 |   a)105 b)125 c)85 d)145 | **1** |
| 19 | **Assertion(A):**A triangle with vertices at (4,0) , ( -1 , -1) , and ( 3,5) is isosceles right angled triangle  **Reason( R):** If ABC is an isosceles triangle , then it is right angled.  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):** 13 is a prime number  **Reason( R):** Every prime number is divisible by one or itself only  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 | For which values of k does the following pair of linear equations have an infinite number of solutions  3x + y - 1= 0  6x + k y – 2 = 0 | **2** |
| 22 | Two line segments AC and BD intersect each other at a point P. Find the measure of  **C:\Users\admin\Downloads\WhatsApp Image 2023-12-27 at 6.33.42 PM.jpeg**  **OR**  are points on sides PR and QR of such that .  Show that ~ .  C:\Users\admin\Downloads\WhatsApp Image 2023-12-31 at 9.59.37 PM (1).jpeg | **2** |
| 23 | TP and TQ are 2 tangents to circle with centre ‘O’ such that = 1100 . Find the measure of . | **2** |
| 24 | Evaluate : | **2** |
| 25 | The radius of a circle is 7 cm and angle subtended by an arc at the centre is 900 . Find the area of minor sector  **OR**  Find the measure of the angle at the centre subtended by an arc of length 22 cm and radius of the circle is 21 cm. | **2** |
|  | **SECTION-C** |  |
|  | **Section C consists of 6 questions of 3 marks each** |  |
| 26 | Prove that is irrational**.** | **3** |
| 27 | Find the zeroes of the polynomial  2x2 +5x +2 and verify the relationship between the zeroes and its coefficients. | **3** |
| 28 | The sum of digits of a two digit number is 9. Nine times this number is twice the number obtained by reversing the order of the digits. Find the number.  **OR**  The fraction becomes if one is added to each of the numerator and the denominator, however if we subtract 5 from each, the fraction becomes find the fraction. | **3** |
| 29 | Two circles are of radii 5 cm and 3cm. Find the length of the chord of the larger circle which touches the smaller circle at a point. | **3** |
| 30 | Prove that  **OR** | **3** |
| 31 | Cards with numbers 2 to 101 are placed in a box. A card is selected at random. Find the probability that the card is  i) An even number ii) A square number iii) a multiple of 5 | **3** |
|  | **SECTION-D** |  |
|  | **Section D consists of 4 questions of 5 marks each** |  |
| 32 | The difference of squares of two numbers is 180. The square of smaller number is 8 times the larger number. Find the two numbers.  **OR**  The diagonal of a rectangular field is 60m more than the shorter side. If the longer side is 30m more than the shorter side , find the sides of the field. | **5** |
| 33 | a) Prove that ‘if a line is drawn parallel to one side of a triangle to intercept, other two sides are divided in the same ratio.’  b) If LM ‖CB and LN ‖ CD , prove that  C:\Users\admin\Downloads\WhatsApp Image 2023-12-31 at 9.25.11 PM.jpeg | **5** |
| 34 | A solid consisting of a right circular cone of height 120cm and radius 60cm standing on a hemisphere of radius 60cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of water left in the cylinder if the radius of the cylinder is 60 cm and its height is 180 cm.  **OR**  A Tent is in the form of a cylinder surmounted by a conical top. If the height and the diameter of the cylindrical part are 2.1 m and 4m respectively and the slant height of the top is 2.8m. Find the area of the canvas used for making the tent also find the cost of canvas of the tent at the rate of Rs 500 per metre square.( base is not covered with canvas) | **5** |
| 35 | The median of the following data is 28.5 find the values of X & Y. If the total frequency is 60   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | CI | 0-10 | 10-20 | 20-30 | 30-40 | `40-50 | 50-60 | total | | Frequecies | 5 | x | 20 | 15 | y | 5 | 60 | | **5** |
|  | **SECTION-E** |  |
|  | **Section E consists of 3 case study based questions.** |  |
| 36 | In a class the teacher asks every student to write an example of A.P. Two friends Geeta and Madhuri write their progressions as -5, -2, 1,4, ... and 187, 184, 181, .... respectively. The teacher asks various students of the class the following questions on these two progressions. Help students to find the answers of the questions. https://cbse.qb365.in/elfinder/Uploads/10%20cbse%20mat/2-Arithmetic%20Progressions/cbse-10th-maths-case%20study-chap5-2.jpg a. Find the 34th term of the progression written by Madhuri.  b. Find the sum of common differences of both the progressions.  c. Which term of the two progressions will have the same value?  OR  Find the sum of first 10 terms of the progression written by  Madhuri. | **4** |
| 37 | Four friends, Jyoti, shalini , Saurabh and Ravi are sitting in a Courtyard at points A,B, C and D respectively as shown in the figure. The courtyard has been divided into small squares by drawing horizontal and vertical lines taking OX and OY as the coordinate axes. Answer the following questions ( observe the points to write the coordinates)  C:\Users\admin\Desktop\cc.PNG  i)Write the coordinates of point A  ii)Find the distance between the points A and B  iii)Find the coordinates of midpoint of the line segment joining the points D and C  OR  Find the coordinates of the point ,when the line segment AC is divided in the ratio 3:2. | **4** |
| 38 | There are two temples on each bank of a river. One temple is 50 m high. A man, who is standing on the top of 50 m high temple, observed from the top that angle of depression of the top and foot of other temple  are30° and 60° respectively.  https://cbse.qb365.in/elfinder/Uploads/10%20cbse%20mat/5-Some%20Applications%20of%20Trigonometry/case%20study/cbse-10th-maths-case%20Study-chap9-1.jpg  Based on the above information, answer the following questions  i)Find the Measure of angle ADF  .Justify  ii)Calculate the Width of the river.  iii)Find the height of the other temple .  OR  Find how much the length of AC greater than AD | **4** |

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