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| Set 1 | Total Pages : 2 |
| **KENDRIYA VIDYALAYA RRC FATEHGARH****PREBOARD-I (2019-20)**  |
|  | SUB: Mathematics Advance |  | CLASS : | X |
|  | Time : 3 hour  |  | Max. Marks : | 80 |
|  | General Instruction: 1. All questions are compulsory2. The question paper consists of 40 questions divided into 4 sections, A, B, C, and D, section A comprises of 20 questions of Multiple choice questions of 1marks each. Section B comprises of 6 questions of 2marks each. Section C comprises of 8 questions of 3marks each and Section D comprises of 6 questions of 4 marks each.3. Use of calculator is not permitted. |  |
|  | **SECTION A** |  |
| Q.1.  | The product of HCF and LCM of 18 and 16 is1. 240 (b) 144 ( c) 288 (d) 230
 | 1M |
| Q.2.  | Show that x = - 4 is a solution of 3x2 + 13x + 4 = 0  | 1M |
| Q.3.  | Given sin A = $\frac{1}{2}$ and cos B = $\frac{1}{2}$ , then A + B is 900 . Write True or False. | 1M |
| Q.4.  | The value of 1 + tan2 A is equal to1. 2 (b) sec2 A ( c) – 1 (d) cot2 A
 | 1M |
| Q.5. | How many tangents can a circle have\_\_\_\_\_\_\_\_\_\_\_\_ | 1M |
| Q.6.  | If a pair of linear equations is consistent, then the lines will be\_\_\_\_\_\_\_\_\_\_\_\_ | 1M |
| Q.7.  | A line intersecting a circle in two points is called a \_\_\_\_\_\_\_\_\_\_\_\_\_ | 1M |
| Q.8.  | The graph of a polynomial P(x) cuts the x axis at two places and touches it at three places. Number of zeroes of P(x) is \_\_\_\_\_\_\_\_\_\_\_\_ | 1M |
| Q.9.  | For what value of k, do the equation 3x – y + 8 = 0 and 6x – ky = - 16 represent coincident lines?1. $\frac{1}{2}$ (b) $\frac{-1}{2}$ ( c) 2 (d) – 2
 | 1M |
| Q.10.  | The sum of zeroes of polynomial is 2x2 – 3x + 4 is1. $\frac{3}{2}$ (b) $\frac{-3}{2}$ (c) 2 (d) -2
 | 1M |
| Q.11. | The radius (in cm) of the largest right circular cone that can be cut out from a cube of edge 4.2 cm is(a) 4.2 (b) 2.1 (c) 8.2 (d) 1.05 | 1M |
| Q.12. | Ratio of volume of two cylinders with equal height is:(a) H : h (b) R : r (c) R2 : r2 (d) None of these | 1m |
| Q.13 | If the area of a square is same as the area of a circle, then the ratio of their perimeters in terms of π is: (a) $\frac{π}{√3}$ (b) $\frac{π}{2}$ (c) $\frac{2}{√π}$ (d) $\frac{3}{√π}$ | 1M |
| Q.14 | If the radius of a circle is decreased by 50%. Then its area will be decrease by:(a) 25% (b) 50% (c) 75% (d) 60% | 1M |
| Q.15 | Distance of the point P( 3, -4 ) from the origin is :(a) 10 (b) 3 (c) $√34$ (d) None of these | 1M |
| Q.16 | If the distance between the points ( 3, 2 ) and ( -1, x ) is 5. Then x = ?(a) 3 (b) 4 (c) 6 (d) 5  | 1M |
| Q.17 | If the nth term of an AP is ( 2n + 1 ), then the sum of its first three term is :(a) 6n +3 (b) 15 (c) 12 (d) 21 | 1M |
| Q.18 | 15th term of the AP, x – 7, x – 2, x + 3,………. is :(a) x + 63 (b) x + 73 (c) x + 83 (d) x + 53 | 1M |
| Q.19 | A boy goes 12 m due North and 5 m due West. How far is he from the starting point?(a) 17 m (b) 7 m (c) 13 m (d) 25 m  | 1M |
| Q.20 | If height of an equilateral triangle is 6 cm. then side of an equilateral triangle is :(a) 4 cm (b) 5 cm (c) 4$√3$ cm (d) 3$√2$ cm | 1M |
|  | **SECTION B** |  |
| Q.21 | Prove that the tangents, drawn at the ends of a diameter of a circle, are parallel.  | 3M |
| Q.22 | If tangents AB and AC, inclined to each other at an angle of 1200 are drawn to a circle with centre O of radius 6 cm, then find the length of each tangent. | 3M |
| Q.23. | In Fig. DE || OQ and DF || OR. Show that EF || QR. | 3M |
| Q.24 | If Cot A = $\frac{17}{18}$, evaluate $\frac{\left(1+Sin A\right)(1-Sin A)}{\left(1+Cos A\right)(1-Cos A)}$ . | 3M |
| Q.25 | One year ago, a man was 8 times as old as his son. At present, his age is equal to the square of his son’s age (in years). Find their present ages. | 3M |
| Q.26 | Without performing the long division, state whether$\frac{13}{3125}$will have a terminating or non-terminating repeating decimal expansion. | 3M |
|  | **SECTION C** |  |
| Q.27 | In fig l and m are two parallel tangents at A and B. the tangent at C makes an intercept DE between l and m. Prove that $∠$DOE = 900 |  3M |
| Q.28. | If $\frac{x}{a}$ cos θ + $\frac{y}{b}$ sin θ = 1 and $\frac{x}{a}$ sin θ - $\frac{y}{b}$ cos θ = 1, prove that $\frac{x^{2}}{a^{2}}$ + $\frac{y^{2}}{b^{2}}$ = 2 | 3M |
| 29 | An umbrella has 8 ribs which are equally spaced (see Fig.) Assuming umbrella to be a flat circle of radius 45 cm, find the area between the two consecutive ribs of the umbrella.  | 3M |
| Q.30 | Find the roots of the following equation :$\frac{1}{x+4 }$ - $\frac{1}{ x-7}$ = $\frac{11}{30}$ | 3M |
| Q.31 | A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in figure .if the height of the cylinder is 10cm, and its base is of radius 3.5 cm,find the total surface area of the article. | 3M |
| Q.32 | State and prove Pythagoras theorem. | 3M |
| Q.33 | Obtain all the zeros of 3x⁴ + 6x3 -2x2 -10x -5 if you know that two of its zeros are  and . | 3M |
| Q.34 | Use Euclid’s division lemma to show that the cube of any positive integer is of the form 9m, 9m+1 or 9m+8 where m is some integer. | 3M |
|  | **SECTION D** |  |
| Q.35. | Determine graphically the coordinates of the vertices of a triangle formed by the equation 2x – 3y + 6 = 0 and 2x + 3y – 18 = 0; and the y-axis. Also, find the area of this triangle. | 4M |
| Q.36. | An express train takes 1 hour less than a passenger train to travel 132 km betweenMysore and Bangalore (without taking into consideration the time they stop atintermediate stations). If the average speed of the express train is 11km/h more than that of the passenger train, find the average speed of the two trains | 4M |
| Q.37. | A container shaped like a right circular cylinder having diameter 12cm and height 15cm is full of ice-cream. The ice-cream is to be filled into cone of height 12cm and diameter 6cm, having a hemispherical shape on the top. Find the number of such cones which can be filled with ice-cream.  | 4M |
| Q.38. | 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed and how many logs are in the top row? | 4M |
| Q.39. | Draw a line segment AB of length 8 cm. Taking A as centre, draw a circle of radius 4 cm and taking B as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle. | 4M |
| Q.40. | From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45°, respectively. If the bridgeis at a height of 3 m from the banks, find the width of the river. | 4M |

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BLUE PRINT

FIRST PRE-BOARD

CLASS X Maths (Standard)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NAME OF CHAPTER | 1(MCQ) | 2(SAI) | 3 (SAII) | 4(VLA) | Q(marks) |
| REAL NUMBERS | 1(1) | 2(1) | 3(1) | ... | 6(3) |
| POLYNOMIALS | 2(2) | .... | .... | .... | 2(2) |
| QUADRATIC EQUATION | 1(1) | 2(1) | 3(1) | 4(1) | 10(4) |
| EQUATION IN TWO VARIABLES | 2(2) | .... | 3(1) | .... | 5(3) |
| ARITHEMATIC PROGRESSIONS | 2(2) | ..... | ... | 4(1) | 6(3) |
| TRIANGLES | 2(2) | 2(1) | 3(1) | .... | 7(4) |
| CO-ORDINATE GEOMETERY | 2(2) | .... | ... | 4(1) | 6(3) |
| INTRODUCTION TO TRIGONOMETERY | 2(2) | 2(1) | 3(1) | .... | 7(4) |
| APPLICATION OF TRIGONOMETRY | ..... | .... | .... | 4(1) | 4(1) |
| CIRCLE | 2(2) | 2(1) | 3(1) | .... | 7(4) |
| CONSTRUCTIONS | .... | .... | .... | 4(1) | 4(1) |
| AREA RELATED TO CIRCLE | 2(2) | 2(1) | 3(1) | .... | 7(4) |
| VOLUME AND SURFACE AREA | 2(2) | ... | 3(1) | 4(1) | 9(4) |
| TOTAL | 20(20) | 12(6) | 24(8) | 24(6) | 80(40) |

* **No. of question (s) are given within brackets and marks outside the brackets**

Marking scheme of first pre-board 2019-20

Class – X Subject – Mathematics (Standard)

|  |  |
| --- | --- |
|  | **SECTION A** |
| **Ans 1** | **(c) 288** |
| **Ans 2** | Full marks for correct answer |
| **Ans 3**  | **True** |
| **Ans 4** | **(b) sec2**A |
| **Ans 5** | **Infinite** |
| **Ans 6** | **Intersecting / co-incident** |
| **Ans7** | **Secant** |
| **Ans 8** | **5** |
| **Ans 9** | **(c) 2** |
| **Ans 10** | 1. **3/2**
 |
| **Ans 11**  | 1. **2.1**
 |
| **Ans 12** | 1. **R2/r2**
 |
| **Ans13** | **(c)**$\frac{2}{√π}$ |
| **Ans14** | (c)75% |
| **Ans15** | 1. **None of these**
 |
| **Ans16** | **(d)5** |
| **Ans17** | **(b)15** |
| **Ans18** | **(a)X+63** |
| **Ans19**  | **(c)13** |
| **Ans20** | **(c)4√3** |
|  | **SECTION B** |
| **Ans 21** | **½ marks for diagram****½ marks for given, to prove** **1 marks for correct proof** |
| **Ans 22** | **½ for diagram** **1 marks for calculation** **½ marks for correct answer (2√3)** |
| **Ans 23** | **Full marks for correct proof** |
| **Ans 24** | **On solving the value of expression is 289/324** |
| **Ans 25** | **Present age of son = x and age father = y****First condition****(y-1) =8(x-1) ½ M****Second condition****Y2 = x2 ½ M****On solving x=7 and y = 49 1 M** |
| **Ans 26** | **Denominator has only 5 as factors,****Hence it is terminating decimals.** |
| **Ans 27** | **full marks for correct proof** |
| **Ans 28** | **Squaring and adding both equations** **And using identities sin2 A + cos2 A = 1.** |
| **Ans 29** | **Angle of sector = 3600/ 8 = 450  ½ M****Area =** $\frac{∅}{360}$**∏r2 ½ M** **= 795.53 cm2 2 M** |
| **Ans 30** | **On solving given expression, Equations becomes** **x2 – 3x + 2 = 0****on solving x = 1, x = 2** |
| **Ans 31** | **Surface area of article =2∏ rh + 2∏r2+ 2∏r2****On putting values, surface area = 374 cm2.** |
| **Ans 32** |  **1 M for statement** **1 M for given, to Prove, and construction and diagram** **1 M for correct proof.** |
| **Ans 33** | **1/2 Mark for finding divisor****1 mark for correct division and quotient** **1½ mark for finding the zeroes, x = -1, -1** |
| **Ans 34** | **Full marks for correct explanation with all three steps**  |
| **Ans 35** | **1 mark for denoting first equation on graph****1 mark for denoting first equation on graph****1 mark for denoting bounded area.****1 mark for finding area, and area = 6 square unit.** |
| **Ans 36** | **Let the speed of express train be x km/h** **Speed of passenger train be (x – 11)km/h** **According to equation** **132/(x – 11) = 132/x + 1****On solving, x2 – 11 – 1452 = 0****On solving x = 44,-33****Hence speed of express train is 44km/h and passenger train is 33km/h**  |
| **Ans 37** | **1 mark for volume of container** **1 mark for volume of ice cream in cone( volume of cone + volume of hemisphere)****I marks for no. of cones = volume of container / volume of ice cream in cone****1 mark for correct answer, n = 10** |
| **Ans 38** | **2 mark for forming correct equation AP** **n2 – 41 n +400 = 0****1 marks for correct explanation of no. of logs n = 16****1 marks for no. of logs in top most row = 5** |
| **Ans 39**  | **2 marks for drawing parental triangle.****1 marks for similar triangle****1 marks for writing steps** |
| **Ans 40** | **2 marks for framing both equations****1 mark for finding the values of angles****1 mark for correct answer i.e width of river is 8.19 m**  |