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| **HY/MAQP/1123/A 09-NOV-2023** | | | | | | | | |
| **HALF YEARLY EXAMINATION (2023-24)** | | | | | | | | |
| **Subject: Mathematics**  **Grade: XI** | | | | | **Max. Marks:80**  **Time:3 hr.** | | | |
| **Name:** | | | | **Section:** | | | | **Roll No:** |
| **Instructions:**  **General Instructions**   * This question paper consists of printed pages. * All questions are to be written in the answer sheet provided. * Section A consists of questions of 1 mark each. * Section B consists of questions of 2 marks each. * Section C consists of questions of 3 marks each. * Section D consists of questions of 4 marks each. * section E consists of questions of 5 marks each | | | | | | | | |
| **Section A (1 mark each)** | | | | | | | | |
|  | If A = {x : x -   5x + 6 = 0}, B = {2, 4}, C = {4, 5} then is | | | | | | | |
|  | **a.** | | {(4, 2), (4, 3)} | | | **b.** | {(2, 2), (3, 3), (4, 4), (5, 5)} | |
| **c.** | | {(2, 4), (3, 4), (4, 4)} | | | **d.** | {(2,4), (3, 4)} | |
| **2.** | The domain of the function f given by f (x)= | | | | | | | |
|  | **a.** | | R – {–3, 2} | | | **b.** | R – [ 3, – 2] | |
| **c.** | | R – { -  2, 3} | | | **d.** | R – ( -  3, -  2) | |
| **3.** | (sin 70° cos 10° -   cos 70° sin 10°) = ? | | | | | | | |
|  | **a.** | |  | | | **b.** |  | |
| **c.** | |  | | | **d.** |  | |
| **4.** | The equation of the line passing through (1, 2) and perpendicular to x + y + 7 = 0 is | | | | | | | |
|  | **a.** | | y-x-1=0 | | | **b.** | y-x+1=0 | |
| **c.** | | y-x+2=0 | | | **d.** | y-x+2=0 | |
| **5.** | is equal to | | | | | | | |
|  | **a.** | | -  cot35 | | | **b.** | cot 55 | |
| **c.** | | -  tan 35 | | | **d.** | tan 55 | |
| **6.** | In a circle, the central angle of 45° intercepts an arc of length 33 cm. The radius of the circle is | | | | | | | |
|  | **a.** | | 42 cm | | | **b.** | 14 cm | |
| **c.** | | 21 cm | | | **d.** | 35 cm | |
| **7.** | Mark the correct answer for (1 -  i) = ? | | | | | | | |
|  | **a.** | |  | | | **b.** |  | |
| **c.** | |  | | | **d.** | None of these | |
| **8.** | If z = then |z|= ? | | | | | | | |
|  | **a.** | | None of these | | | **b.** |  | |
| **c.** | |  | | | **d.** |  | |
| **9.** | The equation of the line passing through the point (2, 3) and parallel to the y-axis is | | | | | | | |
|  | **a.** | | x – 2 = 0 | | | **b.** | y-3=0 | |
| **c.** | | x+2=0 | | | **d.** | none | |
| **10.** | If(x-3)/(x-2)>0 then x belongs | | | | | | | |
|  | **a.** | | (–,2)(3,) | | | **b.** | (–,–3) (–5,) | |
| **c.** | | (–,2][5,) | | | **d.** | (2,3) | |
| **11.** | The solution set of the inequation: is: | | | | | | | |
|  | **a.** | | none of these | | | **b.** | x N | |
| **c.** | | null set | | | **d.** | x W | |
| **12.** | A polygon has 44 diagonals. The number of its sides is | | | | | | | |
|  | **a.** | | 8 | | | **b.** | 11 | |
| **c.** | | 12 | | | **d.** | 10 | |
| **13.** | If p = 20. p , then n = ? | | | | | | | |
|  | **a.** | | 8 | | | **b.** | 11 | |
| **c.** | | 9 | | | **d.** | 10 | |
| **14.** | In how many ways can a cricket team be chosen out of a batch of 15 players, if a particular player is always chosen? | | | | | | | |
|  | **a.** | | None of these | | | **b.** | 1364 | |
| **c.** | | 1001 | | | **d.** | 364 | |
| **15.** | is equal to | | | | | | | |
|  | **a.** | | 6 | | | **b.** | 5 | |
| **c.** | | 4 | | | **d.** | 5 | |
| **16.** | is | | | | | | | |
|  | **a.** | | an irrational number | | | **b.** | a negative real number | |
| **c.** | | a rational number | | | **d.** | a negative integer | |
| **17.** | The sum of the infinite geometric series ? | | | | | | | |
|  | **a.** | |  | | | **b.** |  | |
| **c.** | |  | | | **d.** |  | |
| **18.** | Which term of the GP , 3,3 , .......is 729? | | | | | | | |
|  | **a.** | | 10th | | | **b.** | 12th | |
| **c.** | | 11th | | | **d.** | 13th | |
| **19.** | **Assertion(A): The maximum value of sinx + cosx is 2**  **Reason(R)** :The maximum value of sinx is 1 and maximum value cos is 1 | | | | | | | |
|  | **a.** | | Both A and R are true and R is the correct explanation of A. | | | **b.** | Both A and R are true but R is not the correct explanation of A. | |
| **c.** | | A is true but R is false. | | | **d.** | A is false but R is true. | |
| **20.** | **Assertion**(A):  = 1  **Reason(**R): For the least positive integer of n=4 , | | | | | | | |
|  | **a.** | | Both A and R are true and R is the correct explanation of A. | | | **b.** | Both A and R are true but R is not the correct explanation of A. | |
| **c.** | | A is true but R is false | | | **d.** | A is false but R is true | |
| **Section B (2marks)** | | | | | | | | |
| **21.** | | Find the conjugates of the complex number: . | | | | | | |
| **22.** | | Solve: 1O ≤ −5(𝑥 − 2) < 2O for real x | | | | | | |
| **23.** | | Show that 9 -   8n -   9 is divisible by 64 where n is a positive integer. | | | | | | |
| **24.** | | The first term of a GP is -  3 and the square of the second term is equal to its 4th term. Find its 7th term. | | | | | | |
| **25.** | | State whether the two lines are parallel, perpendicular or neither:  Through (9, 5) and ( -  1, 1) and Through (3, -  5) and (8, -  3). | | | | | | |
|  | | **Section C ( 3 marks )** | | | | | | |
| **26.** | | Let be a function from R into R. Determine the Domain and range of f. | | | | | | |
| **27.** | | Prove that | | | | | | |
|  | |  | | | | | | |
| **28.** | | Express the complex number in the form of a + ib. | | | | | | |
| **29.** | | Using g binomial theorem, expand and hence find the value of | | | | | | |
| **30.** | | Find the foot of the point ( -  8, 12) with respect to the line mirror 4x + 7y + 13 = 0. | | | | | | |
| **31.** | | A vertex of an equilateral triangle is (2, 3) and the equation of the opposite side is  √3x + y = 2. Find the equations of the other two sides. | | | | | | |
| **SECTION-D (4-MARKS)** | | | | | | | | |
| **32.** | | **CASE STUDY**  A permutation is **an act of arranging the objects or numbers in order**. Combinations are the way of selecting the objects or numbers from a group of objects or collections, in such a way that the order of the objects does not matter. image  In, how many ways can the letters of the word PERMUTATIONS be arranged if the   1. words start with P and end with S 2. vowels are all together. 3. There are always 4 letters between P and S | | | | | | |
| **33.** | | The ratio of A M and G. M of two positive no. a and b is m: n  show that. . | | | | | | |
| **34.** | | If A (2, 1), B( -  2, 3) and C (4,5) are the vertices of a ABC then find the equation of   1. the median through C 2. the altitude through B 3. the right bisector of side BC | | | | | | |
| **Section E( 5 marks )** | | | | | | | | |
| **35.** | If cos x = and x lies in the IIIrd quadrant, find the values of cos , sin and sin2x. | | | | | | | |
| **36.** | A solution of 8% boric acid is to be diluted by adding a 2% boric acid solution to it. The resulting mixture is to be more than 4% but less than 6% boric acid. If we have 640 litres of 8% solution, how many litres of 2% solution will have to be added? | | | | | | | |
| **37.** | How many four-digit numbers can be formed from the digits.  1,1,2,2,3,3,4,4,5,5 | | | | | | | |
| **38.** | Find the three numbers in GP whose sum is 21 and sum of their squares is 189 | | | | | | | |

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