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| **HY/MAQP/1123/B 09-NOV-2023**  **HALF YEARLY EXAMINATION (2023-24)** | | | | | | |
| **Subject: MATHEMATICS Maximum marks: 80**  **Grade : XI Time: 3 hours** | | | | | | |
| **Name:** | | | | **Section:** | **Roll No:** | |
| ***General Instructions:***   1. This Question paper contains - five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions. 2. Section A has 18 MCQ’s and 02 Assertion-Reason based questions of 1 mark each. 3. Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each. 4. Section C has 6 Short Answer (SA)-type questions of 3 marks each. 5. Section D has 4 Long Answer (LA)-type questions of 5 marks each. 6. Section E has 3 source based/case based/passage based/integrated units of assessment of 4 marks each with sub-parts | | | | | | |
|  | **Multiple Choice Questions:** | | | | |  |
|  | Range of the function f(x) = is | | | | | |
|  | **a.** | {4} | **b.** | {-4} | | |
|  | **c.** | {-1,1} | **d.** | Any real number | | |
| **2.** | Given set A={2,3} and Set B= {-1,4} . How many relations are possible from A to B | | | | | |
|  | **a.** | 4 | **b.** | 16 | | |
|  | **c.** | 2 | **d.** | 8 | | |
| **3.** | The value of | | | | | |
|  | **a.** |  | **b.** |  | | |
|  | **c.** | 1 | **d.** |  | | |
| **4.** | The value of Sin 500-Sin700+Sin100 | | | | | |
|  | **a.** | 0 | **b.** | 1 | | |
|  | **c.** |  | **d.** | 2 | | |
| **5.** | Find the value of sin | | | | | |
|  | **a.** | 2 | **b.** |  | | |
|  | **c.** |  | **d.** | 0 | | |
| 6. | The conjugate of | | | | | |
|  | **a.** | 4i | **B** | * 4i | | |
|  | **c.** |  | **d.** | 4 | | |
| 7. | If z= | | | | | |
|  | **a.** |  | **b.** |  | | |
|  | **c.** |  | **d.** | None of these | | |
| 8. | The angle between the x-axis and the line joining the points (3,-1) and (4,-2) | | | | | |
|  | **a** |  | **b** |  | | |
|  | **c** |  | **d** | None of these | | |
| 9. | The solution of the inequation | | | | | |
|  | **a** |  | **b** |  | | |
|  | **c** |  | **d** |  | | |
| 10. | Solution of the inequation | | | | | |
|  | **a** |  | **b** |  | | |
|  | **c** |  | **d** |  | | |
| 11. | nPr= 336 and nCr =56 . then r=\_\_\_\_\_ | | | | | |
|  | **a** | 3 | **b** | 2 | | |
|  | **c** | 6 | **d** | 4 | | |
| 12. | Total number of words formed by 2 vowels and 3 consonants taken from 4 vowels and 5 consonants is \_\_\_\_\_\_\_\_\_\_\_\_ | | | | | |
|  | **a** | 6000 | **b** | 7200 | | |
|  | **c** | 1200 | **d** | 720 | | |
| 13. | There are 10 points in a plane, out of which 4 points are collinear. The number of triangles formed with vertices at these points is\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | |
|  | **a** | 20 | **b** | 120 | | |
|  | **c** | 116 | **d** | None of these | | |
| 14. | The number of terms in the expansion of | | | | | |
|  | **a** | 5 | **b** | 7 | | |
|  | **c** | 12 | **d** | 13 | | |
| 15. | Total number of terms in the expansion of is \_\_\_\_\_\_\_ | | | | | |
|  | **a** | 20 | **b** | 21 | | |
|  | **c** | 42 | **d** | None of these | | |
| 16. | The distance of the point P(1,-3) from the line 2y-3x=4 is | | | | | |
|  | **a** | 13 | **b** |  | | |
|  | **c** |  | **d** | None of these | | |
| 17. | The 3rd term of GP is 4. The product of its first 5 terms is \_\_\_\_\_ | | | | | |
|  | **a** |  | **b** |  | | |
|  | **c** |  | **d** |  | | |
| 18. | The sum to infinity of the GP 4,,---------- is \_\_\_\_\_\_ | | | | | |
|  | **a** | 6 | **b** | 5 | | |
|  | **c** |  | **d** |  | | |
|  | **ASSERTION-REASON BASED QUESTIONS**  **In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R).**  **Choose the correct answer out of the following choices.**  **(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.** | | | | | |
| 19. | If ; and Cos B = and  ASSERTION (A): then Tan(A+B) = -  REASON (R): Tan(A**+B) =** | | | | | |
| **20.** | ASSERTION (A):  **If**  REASON (R): | | | | | |
|  | **SECTION B (Question carries 2 marks each)** | | | | | |
| 21. | Find the value of x and y if (1+i)y2 + (6+i) =( 2+i) x | | | | | |
| 22. | Solve .Represent the solution on a number line. | | | | | |
| 23. | Evaluate | | | | | |
| 24. | Find the sum of the series 0.6+ 0.66+ 0.666 + ……… n terms. | | | | | |
| 25. | Find the equation of the right bisector of the line segment joining the points (3,4) and (-1,2) | | | | | |
|  | **SECTION C (Each question carries 3 marks)** | | | | | |
| 26. | Find the coordinate on the foot of the perpendicular drawn from the point (1, -2) on the line.  2x-y+1=0. Also find the length of the perpendicular | | | | | |
| 27. | Find the equation of the line which passes through the point (2, -4) and the sum of whose intercepts on the axes is 5. | | | | | |
| 28. | If a and b are distinct integers, prove that a-b is a factor of where ‘n’ is a positive integer. | | | | | |
| 29. | If | | | | | |
| 30. | Prove that Sin100.Sin500.Sin600.Sin700 | | | | | |
| 31. | Let | | | | | |
|  | **SECTION D (Each question carries 4 marks)** | | | | | |
| 32. | A local body wants to conduct a survey of the wellbeing of the people. For that they want to select the 5-member team from 5 men and 4 ladies.   1. In one of the area, two men belongs to the community in the team is to be included. In how many ways the team to be selected so that three of them are men and two of them are ladies. in the team 2. In how many ways the team can be constituted, so that at least one of them is a man? 3. In how many of the above selection ladies is on majority | | | | | |
| 33. | The sum of two numbers is 6 times their geometric mean, show that the numbers are in the ratio 3+2: 3-2 | | | | | |
| 34. | Find the equation of the sides of an isosceles right-angled triangle the equation of its hypotenuse is 3x+4y=4and the opposite vertex is the point (2,2) | | | | | |
|  | **SECTION E (Each question carries 5 marks)** | | | | | |
| 35. | Prove that | | | | | |
| 36. | A man wants to cut three lengths from a single piece of board of length 91 cm. The second length is to be 3 cm longer than the shortest and third length is to be twice as long as the shortest. What are the possible lengths for the shortest board if third piece is to be at least 5 cm longer than the second? | | | | | |
| 37. | How many different words can be formed by using all the letters of the word ALLAHABAD? (i) In how many of them vowels occupy the even positions? (ii) In how many of them both L do not come together? | | | | | |
| 38. | If a and b are the roots of x2-3x+p=0 and c, d are the roots of x2-12x+q=0, where a, b, c, d form a GP Prove that q + p: q – p = 17:15 | | | | | |

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