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| **HY/MA/1119A 19/11/2019** | |
| **HALF YEARLY EXAMINATION (2019-20)** | |
| **SUBJECT : MATHEMATICS**  **GRADE : XI** | **MAX. MARKS : 80****TIME : 3 Hrs** |
| ***General Instructions:***   1. ***All questions are compulsory.*** 2. ***The question paper consists of 36 questions divided into 4 sections A, B, C, and D.*** 3. ***Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 6 questions of 4 marks each. Section D comprises of 4 questions of 6 marks each.*** 4. ***There is no overall choice. However, an internal choice has been provided in two questions of 2 marks each, two questions of 4 marks each, and one question of 6 marks each. You have to attempt only one of the alternatives in all such questions.*** 5. ***Use of calculators is not permitted.*** | |

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| **SECTION – A**  **(*Q1 - Q10 are multiple choice questions. Select the correct option* )** | | |
| **1.** | The set is equal to | |
|  | a) | b) |
| c) | d) |
| **2.** | Let S = {x: x is a positive multiple of 3 less than 100} & T = {x: x is a prime number less than 20}  Then n(S) + n( T) is | |
|  | a) 34 | b) 41 |
| c) 33 | d) 30 |
| **3.** | The minimum value of 3cos x + 4 sin x + 8 is | |
|  | a) 5 | b) 9 |
| c) 7 | d) 3 |
| **4.** | The value of is equivalent to | |
|  | a) | b) |
| c) | d) None of these |
| **5.** | If -3x +17 < -13 then | |
|  |  | b) |
|  | c) | d) |
| **6.** | The number of ways in which a team of 11 players can be selected from 22 players always including 2 of them and excluding 4 of them is | |
|  | a) 16C11 | b) 16C5 |
|  | c) 16C9 | d) 22C11 |
| **7.** | The third term of G.P is 4. The product of its first 5 terms is | |
|  | a) | b) |
|  | c) | d) None of these. |
| **8.** | Slope of the line which makes equal intercepts on the axes is | |
|  | a) -1 | b) 0 |
|  | c) 2 | d) |
| **9.** | Equation of line passing through (1,2) and parallel to the line | |
|  | a) y+2 = x+1 | b) y+2 = 3(x+1) |
|  | c) y-2 = 3(x-1) | d) y-2 = x-1 |
| **10.** | If the parabola passes through the point (3,2) then the length of its latus rectum is | |
|  | a) | b) |
|  | c) | d) 4 |
| ***( Q 11 - Q15 )Fill in the blanks*** | | |
| **11.** | The domain and range of the real function f defined by is given by \_\_\_\_\_\_\_\_\_\_\_\_ | |
| **12.** | The value of is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **13.** | The middle term in the expansion of is\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **14.** | The quadratic equation such that the A.M between the roots of the equation is 8 and the G.M is 5 is given by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **15.** | If the line touches the circle , then the value of k is \_\_\_\_\_\_\_\_\_\_\_ | |
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| ***(Q 16 to Q20) Answer the following questions*** | | |
| **16.** | If then find the value of . | |
| **17.** | Find the total number of 9-digit numbers that can be formed with all different digits. | |
| **18.** | Find the constant term in the expansion of | |
| **19.** | The fourth term of a G.P is square of its second term and the first term is -3.Determine its 7th term. | |
| **20.** | Find the equation of the circle which touches X-axis and whose centre is (1,2) | |
| **SECTION – B**  **(*Question numbers 21 to carry 26 marks each*)** | | |
| **21.** | Find the sum of the series To n terms | |
| **OR** | | |
|  | Find the sum to n terms of the series whose nth term is n(n - 3) | |
| **22.** | Find the values of x for which the functions are equal | |
| **23.** | If then show that | |
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| **24.** | Find the coefficient of x15 in the expansion of | |
| **OR** | | |
|  | Which term is independent of x in the expansion of | |
| **25.** | Eight chairs are numbered 1 to 8. Two women and 3 men wish to occupy one chair each. First the women choose the chairs amongst the chairs 1 to 4 and then men select from the remaining chairs. Find the total number of possible arrangements. | |
| **26.** | If the eccentricity of an ellipse is and the distance between its foci is 10, then find latus rectum of the ellipse. | |
| **SECTION – C**  **(*Question numbers 27 to 32 carry 4 marks each*)** | | |
| **27.** | Prove the following using P.M.**I** | |
| **28.** | Find the equation of the circle whose Centre is a point (1,-2) and which passes through the centre of  2 | |
| **OR**  Find the equation of the hyperbola with centre at the origin ,transverse axis along x-axis, eccentricity  is and the sum of whose semi axis is 9. | | |
| **29.** | Find the equation of the line though the intersection of 5x – 3y = 1 and and perpendicular to the line | |
| **30.** | If all the letters of the word 'AGAIN' be arranged as in a dictionary, what is the fiftieth word?  **OR**  A candidate is required to answer 7 questions, out of 12 questions which are divided into two groups, each containing 6 questions. He is not permitted to attempt more than 5 questions from either group. In how many ways he can choose 7 questions. | |
| **31.** | Solve the system of linear inequation graphically | |
| **32.** | In a survey of 100 students the number of students studying various languages is found as English only 18; English but not Hindi 23; English and Sanskrit 8 ; Sanskrit and Hindi 8; English 26; Sanskrit 48; and no languages 24.Find  (i) how many students are studying Hindi  (ii) how many students are studying English and Hindi both | |
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| **SECTION – D**  **(*Question numbers 33 to 36 carry 6 marks each*)** | | |
| **33.** | Solve a) cosx – sinx = 1 b) 3θ + 7 θ = 4. | |
| **34.** | Find n, if the ratio of the fifth term from the beginning to the fifth term from the end in the expansion of is : 1. | |
| **35.** | Find the equation of the straight lines passing through (3, -2) and inclined at an angle 60with the line | |
| **OR**  Find the distance of the point (2,3) from the line 2x - 3y + 9 = 0 measured along a line making an  angle 45 with the x-axis. | | |
| **36.** | The sum of 4 numbers in G.P is 60 and A.M of first and last number is 18.Find the numbers. | |

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