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| **FT/MA/1119A 13/06/2019** | | |
| **FIRST TERM EXAMINATION (2019 - 20)** | | |
| **SUBJECT: MATHEMATICS**  **GRADE: XI** | | MAX. MARKS: 80 **TIME: 3 Hrs** |
| **General Instructions**   * *This question paper consists of 3 printed pages.* * *All questions should be written in the answer sheet provided.* * *Section A consists of 20 questions of 1 mark each.* * *Section B consists of 6 questions of 2 marks each.* * *Section C consists of 6 questions of 4 marks each.* * *Section D consists of 4 questions of 6 marks each.* | | |
| **SECTION A** | | |
| 1. | If A = {1, 4, 5}, find the number of elements in P(P(A)). | |
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| 2. | Write the sets A and B in Roster form: | |
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| 3. | From the adjoining Venn diagrams, determine the following sets  (i)  (ii) | |
| 4. | , list the elements of | |
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| 5. | Find the value of: | |
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| 6. | Find the multiplicative inverse of the complex number: | |
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| 7. | If  then find a and b | |
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| 8. | If | |
| 9. | Find the eccentricity of the ellipse . | |
| 10. | Find the equation of the parabola with vertex at origin and directrix y + 3 = 0. | |
| 11. | If a circle passes through (0, 0), (a, 0) and (0, b), then find the coordinates of its center. | |
| 12. | Let f be the subset of defined by Show that f is not a function from **Z** to **Z.** | |
| 13. | Draw the graph of the modulus function and give its equation. | |
| 14. | If A = {1, 2, 3}, B ={3, 4}, C = {4, 5, 6}, find (A×B)∩(B×C) | |
| 15. | Find the domain and range of the relation | |
| 16. | In a circle of diameter 40cm, the length of a chord is 20cm. Find the length of the minor arc of the circle. | |
| 17. | Find the value of | |
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| 18. | Find the value of | |
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| 19. | Show that: | |
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| 20. | Prove that: | |
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| **SECTION B** | | |
| 21. | Two finite sets have m and k elements. If the total number of subsets of first set is 56 more than the total number of subsets of second set, then find the values of m and k. | |
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| 22. | If  is purely real, find real values of θ. | |
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| 23. | Find the lengths of major and minor axes, coordinates of vertices and foci; eccentricity and length of latus rectum of the hyperbola: | |
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| 24. | Let be a function from **Z** to **Z** defined by . Find the values of a and b. | |
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| 25. | Prove that: | |
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| 26. | If where A and B both lie in the second quadrant, find the value of | |
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| **SECTION C** | | |
| 27. | Verify | |
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| 28. | If  where *x, y, a, b ε R*. Show that | |
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| 29. | Find equation of the circle which passes through the center of the circle  and is concentric with the circle | |
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| 30. | Find the equation of the ellipse whose center lies at the origin, major axis lies on the x-axis, eccentricity is and the length of the latus rectum is 5 units. | |
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| 31. | Prove that | |
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| 32. | Find the domain and range of the following functions: | |
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| **SECTION D** | | |
| 33. | In a group of 90 children, 45 play football out of which 30 play football only, 28 play hockey, 25 play cricket, out of which 11 play cricket only. Further 7 play cricket and football but not hockey. 5 play football and hockey but not cricket and 10 play football and cricket both. Represent above information by Venn Diagram. Find: (i) How many play all three games? (ii) How many play hockey only? (iii) How many children play at least one game? (iv) How many children do not play any of the three games? | |
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| 34. | Solve the following quadratic equation on the set of complex numbers *C*: | |
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| 35. | The cable of a uniformly loaded suspension bridge hangs in the form of a parabola. The roadway which is horizontal and 100m long is supported by vertical wires attached to the cable, the longest wire being 30m and the shortest wire being 6m. Find the length of a supporting wire attached to the roadway 18m from the middle. | |
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| 36. | Prove that: | |

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