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| Image result for adamas university logo | **ADAMAS UNIVERSITY**  **END SEMESTER EXAMINATION**  (Academic Session: 2020 – 21) | | |
| **Name of the Program:** | **Bachelor of Computer Application (BCA)** | **Semester:** | **I** |
| **Paper Title:** | **Mathematics I** | **Paper Code:** | **SMA31141** |
| **Maximum Marks:** | **50** | **Time Duration:** | **3 Hrs** |
| **Total No. of Questions:** | **17** | **Total No of Pages:** | **3** |
| *(Any other information for the student may be mentioned here)* | 1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam. 2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page. 3. Assumptions made if any, should be stated clearly at the beginning of your answer. | | |

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| **Group A**  **Answer All the Questions (5 x 1 = 5)** | | | |
| 1 | Find for and | **U** | **CO1** |
| 2 | Find the number of real roots of a cubic equation with real coefficients whose one root is complex. | **U** | **CO1** |
| 3 | Find | **Ap** | **CO2** |
| 4 | Compute | **Ap** | **CO3** |
| 5 | Find the value of | **Ap** | **CO4** |
| **Group B**  **Answer All the *Five* Questions (5 x 2 = 10)** | | | |
| 6 a) | Consider the sets and . Verify that , where be the universal set. | **U** | **CO1** |
| **(OR)** | | | |
| 6 b) | Consider the sets 3, 5} and . Draw separate Venn Diagrams for and , where be the universal set. | **U** | **CO1** |
| 7 a) | Compute | **Ap** | **CO2** |
| **(OR)** | | | |
| 7 b) | Compute | **Ap** | **CO2** |
| 8 a) | Compute | **Ap** | **CO3** |
| **(OR)** | | | |
| 8 b) | Compute | **Ap** | **CO3** |
| 9 a) | Compute | **Ap** | **CO4** |
| **(OR)** | | | |
| 9 b) | Find where . | **Ap** | **CO4** |
| 10 a) | Find the remainder when is divided by | **U** | **CO1** |
| **(OR)** | | | |
| 10 b) | Find the value of | **Ap** | **CO4** |
| **Group C**  **Answer All the *Seven* Questions (7 x 5 = 35)** | | | |
| 11 a) | A relation on the set of integers is defined by }. Find whether the relation is reflexive, symmetric and transitive. Is the relation an equivalence relation? **[5]** | **U** | **CO1** |
| **(OR)** | | | |
| 11 b) | (i) What is surjective mapping?  (ii) Consider the mapping defined by . Examine whether the mapping is injective, surjective and bijective. **[5]** | **U** | **CO1** |
| 12 a) | Examine continuity of the following function at the point  **[5]** | **Ap** | **CO2** |
| **(OR)** | | | |
| 12 b) | Consider function  Find and examine the continuity of at **[5]** | **Ap** | **CO2** |
| 13 a) | Consider the function Find all the points of maxima and minima and corresponding maximum and minimum values of **[5]** | **Ap** | **CO3** |
| **(OR)** | | | |
| 13 b) | Solve the following system of linear equations using Cramer’s rule      **[5]** | **Ap** | **CO3** |
| 14 a) | (i) Compute  **[2.5]**  (ii) Compute **[2.5]** | **Ap** | **CO4** |
| **(OR)** | | | |
| 14 b) | Consider the matrices and .  Then verify that **[5]** | **Ap** | **CO4** |
| 15 a) | (i) Let and be defined by and . Then find the composite mappings and . **[4]**  (ii) Let , then find **[1]** | **U** | **CO1** |
| **(OR)** | | | |
| 15 b) | Find for the matrix **[5]** | **U** | **CO1** |
| 16a) | Solve the equation given that two of its roots are equal in magnitude but opposite in sign. **[5]** | **Ap** | **CO2** |
| **(OR)** | | | |
| 16 b) | If be the roots of the equation , find the equation whose roots are **[5]** | **Ap** | **CO3** |
| 17 a) | (i) Evaluate **[2.5]**  (ii) Evaluate **[2.5]** | **Ap** | **CO4** |
| **(OR)** | | | |
| 17 b) | Solve the equaton using Cardan’s method **[5]** | **Ap** | **CO4** |