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| Image result for adamas university logo | **ADAMAS UNIVERSITY**  **END SEMESTER EXAMINATION**  (Academic Session: 2020 – 21) | | |
| **Name of the Program:** | **Master of Computer Applications** | **Semester:** | **I** |
| **Paper Title:** | **Numerical and Statistical Methods** | **Paper Code:** | **SMA51141** |
| **Maximum Marks:** | **50** | **Time Duration:** | **3 Hrs** |
| **Total No. of Questions:** | **29** | **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 | What is the meaning of the correlation coefficient is zero? | Remembering | **CO1** |
| 2 | Explain stochastic independence of n events. | Understanding | **CO2** |
| 3 | What is degree of precision of a Regula-Falsi method? | Remembering | **CO4** |
| 4 | Write the iteration formula of 2nd order Runga-Kutta method. | Remembering | **CO5** |
| 5 | What is the order of convergence of Newton-Raphson method? | Remembering | **CO6** |
| **Group B**  **Answer Allthe Questions (5 x 2 = 10)** | | | |
| 6 a) | In a contest, two judges ranked eight candidates in order their performance as shown in the following table. Find the rank correlation coefficient.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 1st Judge | 5 | 2 | 8 | 1 | 4 | 6 | 3 | 7 | | 2nd Judge | 4 | 5 | 7 | 3 | 2 | 8 | 1 | 6 | | Remembering | **CO1** |
| **(OR)** | | | |
| 6 b) | 1. What is Karl Pearson’s Measures of Kurtosis? Name different kind (with respect to normal distribution) of distribution depending up on Kurtosis. 2. (ii) First four moments about mean of a distribution are 0, 2.5, 0.7 and 18.75. Find coefficient of skewness and kurtosis. | Remembering | **CO1** |
| 7 a) | If A and B are independent events then show that and are also independent. | Understanding | **CO2** |
| **(OR)** | | | |
| 7 b) | Explain that the pair wise independence of events does not always implies they are mutually independent. | Understanding | **CO2** |
| 8 a) | Tell about bisection method for finding real roots of an algebraic  equation. | Remembering | **CO4** |
| **(OR)** | | | |
| 8 b) | Find one real roots of , correct up to one decimal place using Regula Falsi method. | Remembering | **CO4** |
| 9 a) | Given . Apply Euler’s method to find y(0.1),  correct up to 1 decimal place. | Applying | **CO5** |
| **(OR)** | | | |
| 9 b) | Given . Apply Runge-Kutta method to find y(0.1), correct up to 1 decimal place. | Applying | **CO5** |
| 10 a) | Explain the geometrical interpretation of Simpson’s 1/3 rule. | Understanding | **CO6** |
| **(OR)** | | | |
| 10 b) | Explain the composite Simpson’s rule. | Understanding | **CO6** |
| **Group C**  **Answer Allthe Questions (7 x 5 = 35)** | | | |
| 11 a) | The following results are obtained from records of age (x) and systolic blood pressure (y) of a group of 10 women:  Mean(x) = 53, Mean(y) = 142, var(x) = 130, var(y) = 165 and . Find the appropriate regression line and use it to find the systolic blood pressure of a women whose age is 45 years. | Remembering | **CO1** |
| **(OR)** | | | |
| 11 b) | Two regression lines are of the form 5x + 12 y = 7 and 3x + 8y = 11. Which is the regression line of y on x? | Remembering | **CO1** |
| 12 a) | A lot contains 20 articles. The probability that the lot contains exactly 2 defective articles is 0.4 and the probability that it contains three defective articles is 0.6. the articles are drawn one by one at random and without replacement and they are tested till all defectives are found. Demonstrate the probability that the testing procedure ends at twelfth testing is . | Understanding | **CO2** |
| **(OR)** | | | |
| 12 b) | Show that. | Understanding | **CO2** |
| 13 a) | Given, X be a continuous random variable having following p.d.f.:     1. Find the value of k. 2. Construct the corresponding distribution function. | Remembering  Applying | **CO3** |
| **(OR)** | | | |
| 13 b) | A point X is chosen at random on a line segment AB, where middle point is O. Find the probability that AX, BX and AO can form the sides of a triangle. | Understanding  Applying | **CO3** |
| 14 a) | Find out the root of the following equation using  Regula-falsi method , that lies between 2 and 3,  correct to 3 decimal places. | Remembering | **CO4** |
| **(OR)** | | | |
| 14 b) | Find one real root of  correct up to 5 significant figures by Newton-Rapson method. | Remembering | **CO4** |
| 15 a) | Find one real root of  correct up to 3 significant figures by bisection method. | Remembering | **CO4** |
| **(OR)** | | | |
| 15 b) | Find one real root of  correct up to 2 significant figures by bisection method. | Remembering | **CO4** |
| 16 a) | Find the solution of the following system by Gauss-Seidel method: | Remembering | **CO5** |
| **(OR)** | | | |
| 16 b) | Illustrate Gauss-Seidel iteration formula. | Understanding | **CO5** |
| 17 a) | Find the integral , using Simpson’s 1/3 rule, correct up to 3 decimal places (using step length 0.1). | Remembering | **CO6** |
| **(OR)** | | | |
| 17 b) | Find the integral, using Trapizoidal rule, correct up to 3 decimal places (taking n = 6). | Remembering | **CO6** |