|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | **Student’s Name** | **Student’s ID** | **Group Number** | |  |  |  | |

|  |  |
| --- | --- |
| **Question Number** | **Mark** |
| **Question I** |  |
| **Question II** |  |
| **Question III** |  |
| **Question IV** |  |
| **Question V** |  |
| **Question VI:** |  |
| **Total** |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Question** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | | **Answer** |  |  |  |  |  |  |  |  |   **Question I:**  **A. Choose the correct answer, then fill in the table above:**  **(1) The differential equation is**  **(a) of order 3 and nonlinear (b) of order 4 and nonlinear**  **(c) of order 3 and linear (d) None of the previous**  **(2) The value of that makes exact is**  **(a) (b) 4 (c) (d) None of the previous** |
| **(3) The singular points of the differential equation are**  **(a) (b**  **(c) (d) None of the previous**  **(4) The operator that annihilates is**  **(a) (b)**  **(c) (d) None of the previous**  **(5) If the auxiliary equation of a homogeneous Cauchy- Euler differential equation is then**  **(a) (b)**  **(c) (d) None of the previous** |
| **(6) If the differential equation has a solution the a second solution is**  **(a) (b) (c) (d) None of the previous** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **(7)**  **(a) (b) (c) (d) None of the previous**  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **(8) If is a set of linearly independent solutions of an order differential equation, then**  **(a) (b) (c) None of the previous**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   1. **Without solving classify the differential equations below as separable, linear, exact, homogeneous and/or Bernoulli:** 2. **.**   **Question II :**   1. **Determine the region of the xy-plane for which the differential equation has a unique solution** 2. **Find the orthogonal trajectories of the family**   **passing through the point .**  **Question III:**   1. **Solve the differential equation**      1. **Solve the initial value problem**   **Question IV:**   1. **Solve the following differential equation** 2. **Solve the system of differential equations**   **Question V:**  **Find two linearly independent power series solutions about the ordinary point ,** |
| **Question VI:**   1. **Prove that if and is any real number, then** 2. **Use the Laplace transform to solve the initial value problem**     **Good Luck☺** |