Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination – June – 2017**

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| **Code :** | **15MA3008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PARTIAL DIFFERENTIAL EQUATIONS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Eliminate the arbitrary functions from the following and hence, formulate the Partial differential equations of  i)  ii) | CO1 | 10 |
| b. | Solve the equation by operating Lagrange’s method. | CO1 | 10 |
| (OR) | | | | |
| 2. |  | Discuss the Cauchy’s Method of characteristics in first order non-linear equations. | CO2 | 20 |
| 3. | a. | Apply the concept of classification of second order PDE and hence, sketch the canonical form for hyperbolic equations. | CO2 | 10 |
|  | b. | Construct the derivation of Laplace equation relate to elliptic differential equations. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Summarize the results of separation of variables in elliptic differential equations. | CO3 | 10 |
|  | b. | Show that in cylindrical co-ordinates defined by a relation ,the laplace equation takes the form | CO3 | 10 |
| 5. | a. | Explain the solution of Laplace equation in cylindrical coordinates related to Elliptic differential equations. | CO3 | 10 |
|  | b. | Solve  satisfying the boundry conditionsby applying the general solution of variable separable methods. | CO3 | 10 |
| (OR) | | | | |
| 6. |  | Relate and discuss the occurrence of the elementary solutions of the Diffusion equation in Parabolic differential equations. | CO3 | 20 |
| 7. | a. | Describe the solution of diffusion equation in cylindrical coordinates. | CO4 | 10 |
|  | b. | Determine the temperature in the infinite cylinder  when the initial temperature is and the surface r = a is maintained at temperature. | CO4 | 10 |
| (OR) | | | | |
| 8. | a. | Discuss the derivative of one-dimensional wave equation in hyperbolic differential equations. | CO4 | 10 |
|  | b. | Describe the solution of the PDE:  BCs:    ICs :. | CO4 | 10 |
|  | | **Compulsory**: |  |  |
| 9. |  | Summarize the boundary and initial value problems for two dimentional wave equations by the method of eigen function. | CO5 | 20 |

ALL THE BEST