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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**End Semester Examination –April/May– 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. | Relate the solution of PDE of first order to calculate the general integral of the following linear PDE  i)  ii). | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Construct the complete integral ofby using Charpit’s method of a non linear PDE of first order. | CO1 | 10 |
|  | b. | Disscussand derive the necessary and sufficient conditions for the two PDEs of first order equations to be compatible. | CO1 | 10 |
|  | | | | |
| 3. | a. | Apply the concept of classification of second order PDE and hence, sketch the canonical form for Elliptic equations. | CO2 | 10 |
|  | b. | Solve the equation 3by using the canonical form for Hyperbolic equations. | CO2 | 10 |
| (OR) | | | | |
| 4. |  | Describe the Dirichlet problem for a rectangle by illustrating the general solution of PDE by using variable separable methods. | CO2 | 20 |
|  | | | | |
| 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. |  | Generalize the solution of Diffusion equation in cylindrical coordinates by interpreting the three dimensional diffusion equations. | CO4 | 20 |
| (OR) | | | | |
| 8. | a. | Point out the solution of the wave equation under the following conditions  i) ii) iii) | CO4 | 10 |
|  | b. | Describe the solution of the PDE:  BCs:    ICs :. | CO4 | 10 |
| **Compulsory:** | | | | |
| 9. |  | Summarize the boundary and initial value problems for two dimentionalwave equations by the method of eigen function. | CO5 | 20 |

ALL THE BEST