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 :** | **15PH3008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MATHEMATICAL PHYSICS II** | **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. | Derive Cauchy-Riemann equations. | CO 1 | 10 |
| b. | Estimate whether  is analytic or not. | CO 1 | 10 |
| (OR) | | | | |
| 2. | a. | Expand  in a Laurent’s series if (i)  (ii)  (iii) | CO 1 | 10 |
| b. | Evaluate  where C is a circle of unit radius and centre at  , , | CO 1 | 10 |
| 3. | a. | State and explain Dirichlet’s Conditions. | CO 1 | 10 |
|  | b. | Relate Fourier constants and Fourier series. | CO 1 | 10 |
| (OR) | | | | |
| 4. | a. | Obtain the Fourier series expansion of  Hence deduce the following: | CO 1 | 10 |
|  | b. | Find the Fourier transform of | CO 1 | 10 |
| 5. | a. | Prove that every group is isomorphic to a group of permutations. | CO 1 | 10 |
|  | b. | Show that the identity of a subgroup of a group is the same as that of the group. | CO 1 | 10 |
| (OR) | | | | |
| 6. |  | A string is stretched and fastened to two points  apart. Motion is started by displacing the string the string into the form  from which it is released at time t = 0. Find the displacement of any point of the string at a distance x from one end at any time t. | CO 1 | 20 |
| 7. | a. | Given the values  Find using Newton’s formula. | CO 1 | 10 |
|  | b. | Construct a difference table for the following data:  x : 2 4 9 10  f(x): 21 273 6643 10101 | CO 1 | 10 |
| (OR) | | | | |
| 8. | a. | Given the values:  x : 14 17 31 35  f(x) : 68.7 64 44 39.1  find the value of f(x) corresponding to x = 27 using Lagrange interpolation formula. Also find | CO 1 | 10 |
|  | b. | Apply Gauss’s forward formula to find the value of f(x) = 3.75 from the table.  x : 2.5 3 3.5 4 4.5 5  f(x): 24.145 22.043 20.225 18.644 17.262 16.047 | CO 1 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Calculate by (i) Trapezoidal rule (ii) Simpson’s rule | CO 1 | 10 |
|  | b. | Solve  where y = 0 when x = 0 for x = 0.5 using Picard’s method. | CO 1 | 10 |

ALL THE BEST