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 :** | **14MA2012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NUMERICLA METHODS** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | By the method of least squares find the best fitting straight line to the given data   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | x | 5 | 10 | 15 | 20 | 25 | | y | 16 | 19 | 23 | 26 | 30 | | | CO1 | 10 |
| b. | Fit a parabola by the method of least squares and also estimate the value of y and x=6   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | x | 1 | 2 | 3 | 4 | 5 | | y | 5 | 12 | 26 | 60 | 97 | | CO1 | 10 |
| (OR) | | | | |  |  | (OR) |
| 2. | a. | Fit a curve of the form y=abx to the data   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | x | 1 | 2 | 3 | 4 | 5 | 6 | | y | 151 | 100 | 61 | 50 | 20 | 8 | | CO2 | 10 |
| b. | It is known that the curve y=axb fits in the data given below. Find the best value of a & b   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | x | 1 | 2 | 3 | 4 | 5 | 6 | | y | 1200 | 900 | 600 | 200 | 110 | 50 | | CO2 | 10 |
| 3. | a. | Find the root of 4x-ex =0 that lies between 2 & 3 correct to 4 decimal places | CO2 | 10 |
|  | b. | Solve the system of equation by Gauess Jordan method  x+2y+z=3  2x+3y+3z=10  3x- y+2z =13 | CO2 | 10 |
| (OR) | | | | |  |  | (OR) |
| 4. |  | Solve the following system of equations by Gausee Jacobi mthoed correct to three decimals  10x – 5y - 2z=3  4x-10y+3z= -3  x+6y+10z= -3 | CO2 | 20 |
| 5. |  | The hourly declination of the moon on a day is given below. Find the declination at 3h35m15s and 5h   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Hour | 0 | 1 | 2 | 3 | 4 | | Decli | 8029’  53.7” | 80018’  19.4” | 806’  43.5” | 70 55’  6.1” | 7043’ 27.2” | | CO3 |  |
| (OR) | | | | |  |  | (OR) |
| 6. |  | Apply Gauss forward central difference formula to estimate F(32) from the following   |  |  |  |  |  | | --- | --- | --- | --- | --- | | x | 25 | 30 | 35 | 40 | | F(x) | 0.2707 | 0.3027 | 0.3386 | 0.3794 | | CO3 | 20 |
| 7. |  | Evaluate  using Trepezoibal rule, Simpson’s 1/3 rd and 3/8th rule and verify it using actual integration. | CO2 | 20 |
| (OR) | | | | |  |  | (OR) |
| 8. |  | Using all three Euler’s method sovle numerically dy/dx=1 – y for x=0.1 and 0.2 correct to three decimals. | CO2 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Apply the fourth order Runga Kutta method to find y(0.2) and y(0.4) given that dy/dx = x+y and y(0)=1. | CO3 | 20 |

ALL THE BEST