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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14MA2012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NUMERICAL METHODS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | | | | | | | | | | | | **Course outcome** | | **Marks** |
| **PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)** | | | | | | | | | | | | | | | | |
| 1. | The approximating curve is\_\_\_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | | CO1 |  |
|  | a.Empirical equation | | | b. Linear law | | | | c. | | | | d. | | |  | (1) |
| 2. | In ,  is called as\_\_\_\_\_\_\_ | | | | | | | | | | | | | | CO1 |  |
|  | a. Intercept | b. Slope | | | | | c. Origin | | | | d. Point of intersection | | | |  | (1) |
| 3. | The pattern is reducible to | | | | | | | | | | | | | | CO1 |  |
|  | a. | b. | | | | | c. | | | | | d. | | |  | (1) |
| 4. | The method of fitting curve is \_\_\_\_\_\_\_ | | | | | | | | | | | | | | CO1 |  |
|  | a. Least squares | b. Unique | | | c. Isognal method | | | | | d. Exponential method | | | | |  | (1) |
| 5. | Slope of the equation 3y = 5x-6 | | | | | | | | | | | | | | CO1 |  |
|  | a. | b. | | | | | c.5 | | | | | d.6 | | |  | (1) |
| 6. | The principle of least squares is \_\_\_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | | CO1 |  |
|  | a. E is minimum | b. E is maximum | | | | | c. E>a | | | | | d. E < b | | |  | (1) |
| 7. | n , n is \_\_\_\_\_\_\_ | | | | | | | | | | | | | | CO1 |  |
|  | a. zero | b.one | | | | c. Number of observations | | | | | | d. None of the above | | |  | (1) |
| 8. | The linear form of is\_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | | CO1 |  |
|  | a. | b. | | | | | c. | | | | | d. | | |  | (1) |
| 9. | For some observations the normal equations are ,, | | | | | | | | | | | | | | CO1 |  |
|  | a.-5.7143,-11.0858,10.4001 | b. 5.7143,11.0858,  10.4001 | | | | | c. 5.7143,-11.0858,  -10.4001 | | | | | d. 0, 5.7134, 11 ,  -10.4001 | | |  | (1) |
| 10. | If  the value of a is\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | | CO1 |  |
|  | a. 316.95668 | b.200 | | | | | c.343 | | | | | d. 0.5962 | | |  | (1) |
| 11. | If f(a) and f(b) are of \_\_\_\_\_\_\_\_\_ , a root of f(x)=0 lies between a and b. | | | | | | | | | | | | | | CO1 |  |
|  | a. Opposite signs | b. Same signs | | | | | c.Zero | | | | | d. One | | |  | (1) |
| 12. | For, find the interval a and b where at least one real root lies | | | | | | | | | | | | | | CO1 |  |
|  | a. 2 and 3 | b. 0 and 1 | | | | | c. 1 and 2 | | | | | d. 2 and 3 | | |  | (1) |
| 13. | Formula of Newton Raphson Method\_\_\_\_\_\_\_. | | | | | | | | | | | | | | CO1 |  |
|  | a. | b. | | | | | c. | | | | | d. | | |  | (1) |
| 14. | For a system of 3 simultaneous linear algebraic equations, , find the value of . | | | | | | | | | | | | | | CO1 |  |
|  | a. 2, -1, 3 | b. 1, -1, -1 | | | | | c. 0, 1, 2 | | | | | d. 1, 2, 3 | | |  | (1) |
| 15. | The system linear algebraic equations are equivalent to the form \_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | | CO1 |  |
|  | a. | b. | | | | | c. | | | | | d. | | |  | (1) |
| 16. | To find the interpolation value nearby central value using the method\_\_\_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | | CO2 |  |
|  | a. Gauss’s Interpolation formula | | b. Newton’s Interpolation formula | | | | | | c. Factorial Polynomial | | | | d. All the above | |  | (1) |
| 17. | In Gauss’s backward interpolation formula the value of u is \_\_\_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | | CO2 |  |
|  | a. | b. | | | | | c. | | | | | d. | | |  | (1) |
| 18. | Gauss’s Forward formula involves \_\_\_\_\_\_\_ differences below the central line and \_\_\_\_\_\_\_\_ differences on the line. | | | | | | | | | | | | | | CO2 |  |
|  | a. Odd, odd | b. even, even | | | | | c. odd, even | | | | | d. even, odd | | |  | (1) |
| 19. | Gauss’s backward formula can be used when the value of u lies between \_\_\_\_\_\_\_\_ | | | | | | | | | | | | | | CO2 |  |
|  | a. -1 and 1 | b. -1 and 0 | | | | | c. 1 and 2 | | | | | d. 0 and 1 | | |  | (1) |
| 20. | Find the polynomial passing through the points (0,0), (1,1), (2,20) | | | | | | | | | | | | | | CO2 |  |
|  | a. | b. | | | | | c. | | | | | d. | | |  | (1) |

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| 21. | Let y=f(x). The process of finding x when y is given \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | CO2 | |  | |
|  | a. Inverse Lagrange’s formula | | b. Gauss’s Interpolation formula | | | | | c. Newton’s Interpolation formula | | | | d. Exponential method | |  | | (1) | |
| 22. | The error in the trapezoidal rule of the order\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | CO3 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 23. | In Newton Cote’s quadrature formula, setting n=1 we get \_\_\_\_\_\_\_ | | | | | | | | | | | | | CO3 | |  | |
|  | a. Newton’s forward formula | b. Gauss’s formula | | | | | c. Trapezoidal rule | | | d. Simpson’s rule | | | |  | | (1) | |
| 24. | The truncation error in Trapezoidal rule is \_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | CO3 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 25. | Simpson’s three-eighth rule is applicable when the number of intervals n is \_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | CO3 | |  | |
|  | a. odd | b. even | | | c.Multiple of 3 | | | | d.Multiple of 2 | | | | |  | | (1) | |
| 26. | The error in the Simpson’s one-third rule of the order\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | CO3 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 27. | Simpson’s one-third rule is applicable when the number of intervals n is \_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | CO3 | |  | |
|  | a. 1 | b. 0 | | | c. odd | | | | d. enen | | | | |  | | (1) | |
| 28. | In Newton Cote’s quadrature formula, setting n=2 we get \_\_\_\_\_\_\_ | | | | | | | | | | | | | CO3 | |  | |
|  | a. Simpson’s one-third rule | | | b. Gauss’s formula | | c. Trapezoidal rule | | | | | d. Newton’s formula | | |  | | (1) | |
| 29. | In trapezoidal rule the interpolating polynomial is \_\_\_\_\_\_\_\_\_\_\_\_. | | | | | | | | | | | | | CO3 | |  | |
|  | a. Linear | b. Polynomial of degree 2 | | | c. Polynomial of degree 3 | | | | d. Polynomial of degree n | | | | |  | | (1) | |
| 30. | The truncation error in Simpson’s one third rule is \_\_\_\_\_\_\_\_ | | | | | | | | | | | | | CO3 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 31. | In Newton Cote’s quadrature formula, setting n=3 we get \_\_\_\_\_\_\_ | | | | | | | | | | | | | CO3 | |  | |
|  | a. Simpson’s one-third rule | b. Gauss’s formula | | | c. Trapezoidal rule | | | | d. Simpson’s three-eighths rule | | | | |  | | (1) | |
| 32. | A factorial polynomial \_\_\_\_\_\_\_ | | | | | | | | | | | | | CO2 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 33. |  | | | | | | | | | | | | | CO2 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 34. | The sum of the squares of the residuals of straight line fit is \_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | CO1 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 35. | In Newton forward interpolation method | | | | | | | | | | | | | CO2 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 36. | For solving a system of 3 equations, the initial values in Gauss Seidel Method | | | | | | | | | | | | | CO1 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 37. | Relation between and is\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | CO2 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 38. | Error in the Taylor series method is \_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | | | | | | CO3 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 39. | In Runge Kutta method the solution y(x+h)= \_\_\_\_\_\_\_\_ | | | | | | | | | | | | | CO3 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| 40. | In Runge Kutta third order | | | | | | | | | | | | | CO3 | |  | |
|  | a. | b. | | | c. | | | | d. | | | | |  | | (1) | |
| **PART B(8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)** | | | | | | | | | | | | | | | | |
| 41. | Fit a curve of the form  to the data.  X: 1 2 3 4 5 6  Y: 1200 900 600 200 110 50 | | | | | | | | | | | | CO1 | | (5) | |
| 42. | Find the positive root of by Newton-Raphson method correct to four decimal places. | | | | | | | | | | | | CO1 | | (5) | |
| 43. | Solve the following system of equations by Gauss-seidel metho | | | | | | | | | | | | CO1 | | (5) | |
| 44. | From the following data find the value of y at x=1976 using Newton’s backward interpolation formula:  X: 1941 1951 1961 1971 1981 1991  Y: 20 24 29 36 46 51 | | | | | | | | | | | | CO2 | | (5) | |
| 45. | **F**ind the seventh term of the sequence 2,9,28,65,126,217 | | | | | | | | | | | | CO2 | | (5) | |
| 46. | Apply Gauss’s forward central difference formula and estimate f(32) from the following table:  X: 25 30 35 40  Y: 0.2707 0.3027 0.3386 0.3794 | | | | | | | | | | | | CO3 | | (5) | |
| 47. | Using Lagrange’s formula of interpolation find y(10) from the following data:  X: 5 6 9 11  Y: 12 13 14 16 | | | | | | | | | | | | CO3 | | (5) | |
| 48. | Using Taylor’s method, compute y(1.1) and correct to three decimal places given and y(0)=1. | | | | | | | | | | | | CO3 | | (5) | |
| 49. | Solve the equation , given y(0)=0 using Modified Euler’s method and  Find y(0.1). | | | | | | | | | | | | CO3 | | (5) | |
| 50. | Obtain the values of y at x=0.1, using Runge-kutta method of fourth order for the differential equation , given y(0)=1 | | | | | | | | | | | | CO3 | | (5) | |
| **PART C( 2 X 10 = 20 MARKS) (ANSWER ANY TWO)** | | | | | | | | | | | | | | | | |
| 51. | Fit a straight line and parabola to the following data and find out which one is most appropriate.  X: 1 2 3 4 5  Y: 10 12 8 10 14 | | | | | | | | | | | | CO1 | | (10) | |
| 52. | Solve the system of equations by Gauss-Jordan method | | | | | | | | | | | | CO1 | | (10) | |
| 53. | Evaluate using (i) Trapezoidal rule, (ii) Simpson’s one- third, (iii) Simpson’s three-eighth rule. | | | | | | | | | | | | CO3 | | (10) | |

ALL THE BEST