**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, November 2022**

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|  | **2BT3101** | Roll No. | Total Printed Pages: 2 |
| **2BT3101** |  |
| B. Tech. II Year III-Semester (Main/Back) End Semester Examination, November 2022  **(CV)** | |
| **BCVCSA3101 : Engineering Mathematics - II** | | | |

# Time: 3Hours. Total Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **1.--------------------------Nil--------------------** **2.------------------Nil-----------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** |  | Find the real root of equation xlog10x – 1.2 = 0 by bisection method. | **(12)** | **Evaluating** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.2** |  | Write the Newton-Raphson procedure for finding , where N is a real number. Use it to find the correct two decimals, assuming 2.5 as a initial approximation. | **(12)** | **Applying** |
|  |  |  |  |  |
|  |  | **UNIT-II (CO2)** |  |  |
|  |  |  |  |  |
| **Q.3** |  | Use LU Decomposition methods to solve the system of equations  10x – 2y – 3 z = 205  2 x – 10 y + 2 z = –154  2 x + y – 10z = –120 | **(12)** | **Evaluating** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.4** |  | With the following system of equations  3x +2y = 4.5; 2x+3y – z = 5; –y + 2z = – 0.5,  set up the Gauss-Seidel iteration scheme for solution. Iterate two times, using the initial approximation as x0 = 0.4, y0 = 1.6, z0 = 0.4 | **(12)** | **Evaluating** |
|  |  |  |  |  |
|  |  | **UNIT-III (CO3)** |  |  |
|  |  |  |  |  |
| **Q.5** |  | Apply central difference formula to find from the following table   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | θ0 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | | sin θ0 | 0.342 | 0.502 | 0.642 | 0.766 | 0.866 | 0.939 | 0.984 | | **(12)** | **Applying** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.6** |  | Find x for f(x) = 13 by the inverse interpolation, from the data-  x : 1.2 2.1 2.8 4.1 4.9 6.2  f(x) : 4.2 6.8 9.8 13.4 15.5 19.6 | **(12)** | **Evaluating** |
|  |  |  |  |  |
|  |  | **UNIT-IV (CO4)** |  |  |
|  |  |  |  |  |
| **Q.7** |  | Evaluate ) dx  By using Simpson’s Rules and compares the errors in both the cases. | **(12)** | **Analyzing** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.8** |  | Using the following data, Compute the integral –     |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | X | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | | y | 0.4804 | 0.5669 | 0.6490 | 0.7262 | 0.7985 | 0.8658 | 0.9281 |   by using   1. Trapezoidal rule 2. Simpson’s and rules. | **(12)** | **Applying** |
|  |  |  |  |  |
|  |  | **UNITV (CO5)** |  |  |
|  |  |  |  |  |
| **Q.9** | **(a)** | Solve the equation + ; y(1) = 0.5  At x = 1.2 and 1.4 by Euler’s Method. | **(6)** | **Applying** |
|  |  |  |  |  |
|  | **(b)** | Apply Milne’s Method to find a solution of –    Given that –  x : 0.2 0.4 0.6  y : 0.02 0.0795 0.1762 | **(6)** | **Analyzing** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.10** |  | Apply Runge - Kutta Method of Fourth order to solve – | **(12)** | **Analyzing** |