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SASTRA » Numerical & Statistical Analysis

Unit 3 - UNIT - III : Numerical Solutions of ODE

Course outline

UNIT - I :
Transcendental
Polynomial &
Simultaneous
equations and
⊞ **Interpolations ()**

UNIT - II :
Numerical
differentiation and
⊞ **Integration ()**

UNIT - III :
Numerical
Solutions of ODE
⊟ **()**

○ Lecture 1: Solution by
Taylor series- First
order ODE (week 7)
(unit?
unit=34&lesson=35)

○ Lecture 2 Solution by
Taylor's series - Second
and simultaneous ODEs
(week 7) (unit?
unit=34&lesson=36)

○ Lecture 3-Solution of
Second order and
Simultaneours ODE by
Taylor's series
method(contd.,)(Week
7) (unit?
unit=34&lesson=37)

○ Quiz: Assessment -- 7
(assessment?
name=45)

○ Lecture 4 Solution of
First order ODE by
Picard's Method (Week
8) (unit?
unit=34&lesson=38)

○ Lecture 5 :Solution by
Picard's method
(contd) (week 8) (unit?
unit=34&lesson=39)

○ Lecture 6 -Solution by
Euler's method –
Improved and modified

Assessment -- 8

The due date for submitting this assignment has passed.

Due on 2023-05-14, 23:59 IST.

As per our records you have not submitted this assignment.

Euler method

1) find the value of y(0.2) by modified Euler's method, given that y' = x -- y^2, y(0) = 1 **1 point**

○ 0.858
○ 0.885
○ 0.588
○ 0.8

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.858

2) find the value of y(0.2) by improved euler's method, given that y' = x -- y^2, y(0) = 1 **1 point**

○ 0.856
○ 0.885
○ 0.658
○ 0.568

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.856

3) Find the value of y(1.2) by Improved Euler's method given that y' = (2y / x) + x^3, y(1) = 0.5 **1 point**

○ 1.32
○ 1.032
○ 1.023
○ 1.203

No, the answer is incorrect.
Score: 0
Accepted Answers:
1.023

4) Error in modified Euler method is of order **1 point**

○ h
○ fourth power of h
○ square of h
○ cube of h

No, the answer is incorrect.
Score: 0
Accepted Answers:
cube of h

5) In which of the following method , approximate the curve of solution by tangent in each interval **1 point**

○ Picard method
○ Euler method
○ Newton method
○ Runge-Kutta method

No, the answer is incorrect.
Score: 0
Accepted Answers:
Euler method

6)   The modified Euler method is based on the average of ____.   *1 point*

- ○ Straight line
- ○ Ellipse
- ○ chord
- ○ points

No, the answer is incorrect.
Score: 0
Accepted Answers:
points

7)   Euler formula for the solutions provides a pair of ____ formulas.   *1 point*

- ○ Taylor Method.
- ○ Runge-Kutta Method.
- ○ Predictor-corrector methods
- ○ Newton's method

No, the answer is incorrect.
Score: 0
Accepted Answers:
Predictor-corrector methods

8)   In improved Euler method   *1 point*

- ○ slope at $(x0,y0)$ is taken
- ○ slope at $(x1,y1)$ is taken
- ○ average of slopes at (x_0,y_0) and $(x\_1,y\_1^{(1)})$ is taken
- ○ none of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
average of slopes at (x_0,y_0) and $(x\_1,y\_1^{(1)})$ is taken

9)   In the geometrical meaning of Euler's algorithm , the curve is approximated as a   *1 point*

- ○ Ellipse
- ○ parabola
- ○ circle
- ○ straight line

No, the answer is incorrect.
Score: 0
Accepted Answers:
straight line

10) $y_{n+1} = y_n + h \, f(x_n , y_n)$ is the iterative formula for   *1 point*

- ○ Milne's method
- ○ Adam's method
- ○ Euler's method
- ○ Taylor's method

No, the answer is incorrect.
Score: 0
Accepted Answers:
Euler's method

11) Using Euler's method $dy/dx = (2 -- y^2) / 5x$, $y(4) = 1$ the value of $y(4.1)$ is   *1 point*

- ○ 1.005
- ○ 1.118
- ○ 1.125
- ○ 1.2356

No, the answer is incorrect.
Score: 0
Accepted Answers:
1.005

12) Using Euler's method $dy/dx = 4 + x^2 + y$, $y(0) = 1$ the value of $y(0.05)$ is ----   *1 point*

- ○ 1.25
- ○ 1.52
- ○ 1.12
- ○ 2.2

No, the answer is incorrect.
Score: 0
Accepted Answers:
1.25

13) Condition for convergence in Picard's method is   *1 point*

- ○ $f(x,y)$ and $\partial f/\partial x$ are discontinuous

○ f(x,y) is continuous and ∂f/∂x is discontinuous
○ f(x,y) is discontinuous and ∂f/∂x is continuous
○ f(x,y) and ∂f/∂x are continuous

No, the answer is incorrect.
Score: 0

Accepted Answers:
f(x,y) and ∂f/∂x are continuous

14) The value of y(0.1) becomes --------, $y' = y - x^2$, y(0) = 1 by Picard's method   **1 point**

○ 1.105
○ 0
○ 1
○ 0.1

No, the answer is incorrect.
Score: 0

Accepted Answers:
1.105

15) Solving by picard's method value of $y' = x^2 + y^2$, y(0) = 0 becomes   **1 point**

○ 0
○ 1
○ $1/5\ x^3 + 1/63\ x^7$
○ Not possible

No, the answer is incorrect.
Score: 0

Accepted Answers:
$1/5\ x^3 + 1/63\ x^7$

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