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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Problem solving through Programming In C (course)

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Unit 13 - Week 11

Assignment 11

The due date for submitting this assignment has passed.   Due on 2020-04-15, 23:59 IST.
As per our records you have not submitted this assignment.

1) Interpolation is a process for   *1 point*

   ○ a) extracting feasible data set from a given set of data
   ○ b) finding a value between two points on a line or curve.
   ○ c) removing unnecessary points from a curve
   ○ d) all of the mentioned

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) finding a value between two points on a line or curve.

2)   *1 point*

Given two data points $(a, f(a))$ and $(b, f(b))$, the linear Lagrange polynomial $f(x)$ that passes through these two points are given as

○   a) $f(x) = \frac{x-b}{a-b} f(a) + \frac{x-a}{a-b} f(b)$

○   b) $f(x) = \frac{x}{a-b} f(a) + \frac{x}{b-a} f(b)$

○   c) $f(x) = f(a) + \frac{f(b)-f(a)}{b-a} f(b)$

○ d) $f(x) = \frac{x-b}{a-b}f(a) + \frac{x-a}{b-a}f(b)$

No, the answer is incorrect.
Score: 0

Accepted Answers:

d) $f(x) = \frac{x-b}{a-b}f(a) + \frac{x-a}{b-a}f(b)$

3)   **1 point**

A Lagrange polynomial passes through three data points as given below

x	5	10	15
$f(x)$	15.35	9.63	3.74

The polynomial is determined as $f(x) = L_0(x).(15.35) + L_1(x).(9.63) + L_2(x).(3.74)$
The value of $f(x)$ at $x = 7$ is

○ a) 12.78
○ b) 13.08
○ c) 14.12
○ d) 11.36

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) 13.08

4)

The value of $\int_0^{1.5} xe^{2x}dx$ by using one segment trapezoidal rule is (upto four decimal places)

[   ]

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Numeric) 22.5962

                                                                        1 point

5) Accuracy of the trapezoidal rule increases when   **1 point**

○ a)   integration is carried out for sufficiently large range
○ b) instead of trapezoid, we take rectangular approximation function
○ c) number of segments are increased
○ d) integration is performed for only integer range

No, the answer is incorrect.
Score: 0

Accepted Answers:
c) number of segments are increased

6)   *1 point*

Solve the ordinary differential equation below using Runge-Kutta 4th order method.
Step size h=0.2.

$$5\frac{dy}{dx} + xy^3 = \cos(x), y(0) = 3$$

The value of y(0.2) is (upto two decimal points)

- a) 2.86
- b) 2.93
- c) 3.13
- d) 3.08

No, the answer is incorrect.
Score: 0

Accepted Answers:
b)   2.93

7) Which of the following cannot be a structure member?   *1 point*

- a) another structure
- b) function
- c) array
- d) none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
b) function

8)   *1 point*

Match the following

A. Newton Method	1. Integration
B. Lagrange Polynomial	2. Root finding
C. Trapezoidal Method	3. Differential Equation
D. Runge Kutta Method	4. Interpolation

- a) A-2, B-4, C-1, D-3
- b) A-3, B-1, C-2, D-4
- c) A-1, B-4, C-3, D-2
- d) A-2, B-3, C-4, D-1

No, the answer is incorrect.
Score: 0

Accepted Answers:
a) A-2, B-4, C-1, D-3

9)   *1 point*

The value of $\int_1^3 e^x(\ln x)dx$ calculated using the Trapezoidal rule with five subintervals is

(* range is given in output rather than single value to avoid approximation error)

○ a) 12.56 to 12.92
○ b) 13.12 to 13.66
○ c) 14.24 to 14.58
○ d) 15.13 to 15.45

No, the answer is incorrect.
Score: 0

Accepted Answers:

c) 14.24 to 14.58

10)   **1 point**

Consider the same recursive C function that takes two arguments

unsigned int func(unsigned int n, unsigned int r)
{
 if (n > 0) return (n%r + func (n/r, r));
 else return 0;
}

What is the return value of the function func when it is called as func(513, 2)?

○ a) 9
○ b) 8
○ c) 5
○ d) 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
d) 2