X

Week 11 : Assignment 11

The due date for submitting this assignment has passed.

Due on 2023-10-11, 23:59 IST.

Assignment submitted on 2023-10-11, 20:45 IST

1) ***1 point***

Interpolation provides a mean for estimating functions
a) At the beginning points
b) At the ending points
c) At the intermediate points
d) None of the mentioned

- a) Option (a)
- b) Option (b)
- c) Option (c)
- d) Option (d)

Yes, the answer is correct.
Score: 1

Accepted Answers:
c) Option (c)

2) ***1 point***

To solve a differential equation using Runge-Kutta method, necessary inputs from user to the algorithm is/are
a) the differential equation dy/dx in the form x and y
b) the step size based on which the iterations are executed.
c) the initial value of y.
d) all the above

a) Option (a)
b) Option (b)
c) Option (c)
d) Option (d)

Yes, the answer is correct.
Score: 1

Accepted Answers:
d) Option (d)

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

Yes, the answer is correct.
Score: 1

Accepted Answers:
b) 13.08

4) ***1 point***

The value of $\int_0^{3.2} xe^x dx$ by using one segment trapezoidal rule is
a) 172.7
b) 125.6
c) 136.2
d) 142.8

a) Option (a)
b) Option (b)
c) Option (c)
d) Option (d)

Yes, the answer is correct.
Score: 1

Accepted Answers:
b) Option (b)

5) ***1 point***

Accuracy of the trapezoidal rule increases when
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 performedfor only integer range

a) Option (a)
b) Option (b)
c) Option (c)
d) Option (d)

Yes, the answer is correct.
Score: 1

Accepted Answers:
c) Option (c)

6) ***1 point***

Solve the ordinary differential equation below using Runge-Kutta4th 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

Yes, the answer is correct.
Score: 1

Accepted Answers:
b) 2.93

7) ***1 point***

Match the following

A. Newton Method	1. Integration
B. Lagrange Polynomial	2. Root finding
C. Trapezoidal Method	3. Differential Equation
D. RungeKutta 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

a) Option (a)
b) Option (b)
c) Option (c)
d) Option (d)

Yes, the answer is correct.
Score: 1

Accepted Answers:
a) Option (a)

8) **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

- a) Option (a)
- b) Option (b)
- c) Option (c)
- d) Option (d)

Yes, the answer is correct.
Score: 1

Accepted Answers:
c) Option (c)

9) **1 point**

Consider the same recursive C function that takes two arguments

```
unsignedintfunc(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 foo when it is called as func(513, 2)?

- a) 9
- b) 8
- c) 5
- d) 2

Yes, the answer is correct.
Score: 1

Accepted Answers:
d) 2

10) What is the output? ***1 point***

```
#include <stdio.h>
int fun(int n)
{
if (n == 4)
return n;
else return 2*fun(n+1);
}
int main()
{
printf("%d ", fun(2));
return 0;
}
```

- a) 4
- b) 8
- c) 16
- d) Error

Yes, the answer is correct.
Score: 1

Accepted Answers:
c) 16