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SASTRA » Numerical &amp; Statistical Analysis

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## Unit 2 - UNIT - II : Numerical differentiation and Integration

### Course outline

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



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



- Lecture 1 : First and second order differentiation - Introduction (week 4) (unit? unit=19&lesson=20)
- Lecture 2 : First and second order Differentiation - Newton's , Stirling's and Lagrange's formula(week 4) (unit? unit=19&lesson=21)
- Quiz: ASSESSMENT - 4 (assessment? name=89)
- Lecture 3 : Differentiation based on finite differences (week 5) (unit? unit=19&lesson=22)
- Lecture 4: Solution of ODE by the method of finite differences(week 5) (unit? unit=19&lesson=23)
- Lecture 5 :Numerical Integration – Trapezoidal rule (week 5) (unit? unit=19&lesson=24)
- Lecture 6: Numerical Integration - Romberg's method (week 5) (unit? unit=19&lesson=25)
- Quiz: Assessment – 5 (assessment?)

## Assessment -- 6

The due date for submitting this assignment has passed.

Due on 2023-04-30, 23:59 IST.

As per our records you have not submitted this assignment.

Simpson's rule

- 1) Simpson's 1/3rd rule is applied when n is a multiple

1 point

- ☐ Two  
☐ five  
☐ seven  
☐ none of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Two

- 2) The three-eighth rule of Simpson applies if number of subinterval is a multiple

1 point

- ☐ Two  
☐ Three  
☐ Seven  
☐ none of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Three

- 3) The error in the simpson's 1/3rd rule is of order

1 point

- ☐ h  
☐ square of h  
☐ cube of h  
☐ fourth power of h

No, the answer is incorrect.

Score: 0

Accepted Answers:

fourth power of h

- 4) In which of the following numerical methods total number of points must be odd?

1 point

- ☐ Trapezoidal Rule  
☐ Simpson' s 1/3 Rule  
☐ Simpson 3/8 Rule  
☐ None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Simpson' s 1/3 Rule

- 5) In application of Simpson's 1/3rd rule, the interval h for closer approximation should be \_\_\_\_\_

1 point

- ☐ even  
☐ small  
☐ odd  
☐ even and small

No, the answer is incorrect.

Score: 0

Accepted Answers:

small

name=30)

- ☐ Lecture 7 : Numerical Integration – Simpson's rule (week 6) (unit? unit=19&lesson=26)
- ☐ Lecture 8 : Numerical Integration - Simpson's rule (cont..) (week 6) (unit? unit=19&lesson=27)
- ☐ Quiz: Assessment – 6 (assessment? name=32)

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

**UNIT - IV :**  
**Statistical**  
**distributions and**  
**Test of hypothesis**  
 ()

**Unit V : Non-**  
**parametric**  
**statistical**  
**methods & Time**  
**series analysis ()**

6) using romberg's method find integral 0 to 1 (dx / 1 + x) correct to 3 decimals. h = .25

1 point

- ☐ 0.697
- ☐ 0.769
- ☐ 0.679
- ☐ 0.967

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 0.697

7) By Simpson's 1/3 rd formula find integral 0 to 1/2 (x / sinx), h = 1 / 16 becomes-----

1 point

0

- ☐ 0.517
- ☐ 0.5071
- ☐ 0.5701
- ☐ 0.1750

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 0.5071

8) Which of the formula does not require that the interval of integration be divided into an even number of intervals ?

1 point

- ☐ Simpson's formula
- ☐ Weddle formula
- ☐ Trapezoidal rule
- ☐ None of the above

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 Trapezoidal rule

9) The value of integral of (sinx - logx + e^x) between 0.2 and 1.4 using Simpson's 1/3 rd rule by taking h = 0.2 will be

1 point

0

- ☐ 4.0125
- ☐ 4.1205
- ☐ 4.5021
- ☐ 4.0521

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 4.0521

10) The degree of accuracy in Simpson's (1/3)rd Rule is

1 point

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 6

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 3

11) In Simpson's rule will give exact result, if the entire curve y=f(x) is itself a \_\_\_\_.

1 point

- ☐ Straight line.
- ☐ Chord.
- ☐ Parabola.
- ☐ Tangent line.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 Parabola.

12) By setting n=2 in Newton-cote quadrature formula we obtain

1 point

- ☐ Trapezoidal rule
- ☐ Simpson's three-eighths rule
- ☐ Simpson's one-third rule
- ☐ Weddle's rule.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:  
 Simpson's one-third rule

13) The area of the given data X 1 1.5 2 2.5 3 3.5 4 Y 2 2.4 2.7 2.8 3 2.6 2.1 using Simpson's 1/3rd rule area is \_\_\_\_.

1 point

- ☐ 7.8
- ☐ 7.7
- ☐ 7.78
- ☐ 7.87

No, the answer is incorrect.

Score: 0

Accepted Answers:

7.78

14) The value of integral  $e^x$  is evaluated from 0 to 0.4 by the following formula. Which method will give the least error ? **1 point**

- ☐ Trapezoidal rule with  $h = 0.2$
- ☐ Trapezoidal rule with  $h = 0.1$
- ☐ Simpson's 1/3 rule with  $h = 0.1$
- ☐ all the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Simpson's 1/3 rule with  $h = 0.1$

15) The results obtained by using Simpson's rule will be greater than those obtained by using the trapezoidal rule **1 point**

- ☐ provided the intervals are small
- ☐ provided the boundary is concave towards the base line
- ☐ provided the boundary is convex towards the base line.
- ☐ All the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

provided the boundary is concave towards the base line



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