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## MTH603 Final Term Papers By Waqar (File 1)

**Question No : 1 of 52**

To apply Simpson's 1/3 rule, the number of intervals in the following must be

**Answer ( Please select your correct option )**

C 6  
C 7  
C 9  
C 11

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**Question No : 2 of 52**

In integrating  $\int x^2 dx$ , by dividing the interval into eight equal parts, width of the interval should be

**Answer ( Please select your correct option )**

C 0.125  
C 0.250  
C 0.500  
C 0.625

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Question No : 3 of 52 Marks: 1 (Budgeted Time 1 Min)

The minimum interval in which the root of the equation  $x^2 - 3x + 1 = 0$  lie is

Answer ( Please select your correct option )

(0, 1)  
(1, 2)  
(2, 4)  
(0, 2)

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Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

..... lies in the category of iterative method.

Answer ( Please select your correct option )

None of the given choices  
Bracketing Method  
Regula Falsi Method  
Muller's Method

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Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)

For the equation  $x^3 + 3x - 1 = 0$ , the root of the equation lies in the interval.....

Answer ( Please select your correct option )

(0, 1)  
(1, 2)  
(1, 3)  
(1, 2)

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Question No : 6 of 52 Marks: 1 (Budgeted Time 1 Min)

The quantity of error which is present in the statement of the problem itself, before finding its solution is called

Answer ( Please select your correct option )

Inherent error  
Local round off error  
Local Truncation error  
Typing error

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Question No : 7 of 52 Marks: 1 (Budgeted Time 1 Min)

In Regula Falsi Method two points  $x_1$  and  $x_{+1}$  are chosen such that  $f(x_1)$  and  $f(x_{+1})$  have -----signs

Answer ( Please select your correct option )

+ve  
-ve  
Opposite  
Same

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Question No : 8 of 52 Marks: 1 (Budgeted Time 1 Min)

Regula Falsi Method lies in the category of -----

Answer ( Please select your correct option )

Iterative method  
Bracketing method  
Random method  
Graphical method

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Question No : 9 of 52 Marks: 1 (Budgeted Time 1 Min)

Secant method converges -----than bisection.

Answer ( Please select your correct option )

Faster

Slower

Equally

None of the given choices

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Question No : 10 of 52 Marks: 1 (Budgeted Time 1 Min)

Muller's method is a generalization of

Answer ( Please select your correct option )

Bisection method

Iteration method

Secant method

Regula Falsi method

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Question No : 11 of 52 Marks: 1 (Budgeted Time 1 Min)

Diagonal dominance of a coefficient matrix is strictly checked in

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MULLER'S METHOD  
BISECTION METHOD  
JACOBI'S METHOD  
NEWTON-RAPHSON METHOD

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Question No : 12 of 52 Marks: 1 (Budgeted Time 1 Min)

It can be verified that for matrix  $A = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$

AA<sup>-1</sup> = I , I = identity matrix  
AA<sup>-1</sup> = D , D = diagonal matrix  
AA<sup>-1</sup> = S , S = symmetric matrix  
AA<sup>-1</sup> = Z , Z = orthogonal matrix

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Question No : 13 of 52 Marks: 1 (Budgeted Time 1 Min)

If  $[A]$  is an  $n \times n$  real symmetric matrix, its eigen values are real, and there exists an orthogonal matrix  $[S]$  such that the diagonal matrix  $[D]$  is given by

Answer ( Please select your correct option )

$[D] = [S]^{-1}[A][S]$

$[D] = [S]^{-1}[S][A]$

$[D] = [S]^2[A][S]$

None of the above

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Question No : 14 of 52 Marks: 1 (Budgeted Time 1 Min)

The symbol used for average operator is

Answer ( Please select your correct option )

$\Delta$

$\mu$

$\nabla$

$\delta$

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Question No : 15 of 52 Marks: 1 (Budgeted Time 1 Min)

P in Newton's backward difference formula is defined as

Answer ( Please select your correct option )

$p = \left( \frac{x - x_0}{h} \right)$

$p = \left( \frac{x + x_0}{h} \right)$

$p = \left( \frac{x + x_1}{h} \right)$

$p = \left( \frac{x - x_1}{h} \right)$

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Question No : 16 of 52 Marks: 1 (Budgeted Time 1 Min)

Given the following data

x	1	2	-4
f(x)	3	-5	-4

Which formula is useful in finding the interpolating polynomial?

Answer ( Please select your correct option )

Newton's backward difference formula

Lagrange's interpolation formula

None of the given choices

Newton's forward difference formula

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Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

Newton's divided difference interpolation formula is used when the values of the independent variable are

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Answer ( Please select your correct option )

Equally spaced  
 Not equally spaced  
 Constant  
 None of the above

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Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

Given the following data

x	4	5	7	10
f(x)	48	100	294	900

Answer ( Please select your correct option )

94  
 97  
 194  
 52

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Question No : 19 of 52 Marks: 1 (Budgeted Time 1 Min)

Given the following data

$x$	1	3	7
$f(x)$	2	4	10

Answer ( Please select your correct option )

Newton's forward difference interpolation formula

Newton's backward difference interpolation formula

Lagrange's interpolation formula

None of the given choices

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Question No : 20 of 52 Marks: 1 (Budgeted Time 1 Min)

For the given table of values

$x$	0.1	0.2	0.3	0.4	0.5	0.6
$f(x)$	0.425	0.475	0.400	0.452	0.525	0.575

using two-point equation the value of  $f'(0.2)$  is.....:

Answer ( Please select your correct option )

0.75

-0.75

0.5

-0.5

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Question No : 21 of 52 Marks: 1 (Budgeted Time 1 Min)

If  $y(x)$  is approximated by a polynomial  $P_n(x)$  of degree  $n$  then the error is given by

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Answer ( Please select your correct option )

$e(x) = y(x) + P_n(x)$

$e(x) = y(x) - P_n(x)$

$e(x) = P_n(x) - y(x)$

$e(x) = y(x) \times P_n(x)$

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Question No : 22 of 52 Marks: 1 (Budgeted Time 1 Min)

Let  $I$  denotes the closed interval spanned by  $x_0, x_1, x_2, x_3, x_4, x_5, x_6, x_7, \bar{x}$ . Then  $F(x)$  vanishes -----times in the interval  $I$ .

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Answer ( Please select your correct option )

6

9

7

8

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Question No : 23 of 52 Marks: 1 (Budgeted Time 1 Min)

If  $f(x) = 5x^6 + 6x^5 - 7x^3 - 9x^2 + 4x - 3$ , then its-----derivative is zero for all  $x$ .

Answer ( Please select your correct option )

4th

7th

6th

5th

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Question No : 24 of 52 Marks: 1 (Budgeted Time 1 Min)

From the following table of values:

$x$	1.00	1.05	1.10	1.15	1.20	1.25	1.30
$y$	1.0000	1.0247	1.0488	1.0724	1.0954	1.1180	1.1402

Answer ( Please select your correct option )

Forward difference operator

Backward difference operator

Central difference operator

None of the given choices

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Question No : 25 of 52 Marks: 1 (Budgeted Time 1 Min)

In Richardson's extrapolation method, the extrapolation process is repeated until accuracy is achieved, this is called extrapolation to the .....

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Answer ( Please select your correct option )

limit

function

arbitrary value of 'h'

none of given choices

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Question No : 26 of 52 Marks: 1 (Budgeted Time 1 Min)

While deriving Simpson's 3/8 rule, we approximate  $f(x)$  in the form .....

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Answer ( Please select your correct option )

$ax + b$

$ax^2 + bx + c$

$ax^3 + bx^2 + cx + d$

$ax^4 + bx^3 + cx^2 + dx + e$

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Question No : 27 of 52 Marks: 1 (Budgeted Time 1 Min)

Whe we apply Simpson's 3/8 rule, the number of intervals n must be

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Answer ( Please select your correct option )

Even

Odd

Multiple of 3

Multiple of 8

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Question No : 28 of 52 Marks: 1 (Budgeted Time 1 Min)

To apply Simpson's 1/3 rule, valid number of intervals are.....

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Answer ( Please select your correct option )

7

8

5

3

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Question No : 29 of 52 Marks: 1 (Budgeted Time 1 Min)

In integrating  $\int_0^1 e^{2x} dx$  by dividing into eight equal parts, width of the interval should be .....

Answer ( Please select your correct option )

0.250  
0.500  
0.125  
0.625

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Question No : 30 of 52 Marks: 1 (Budgeted Time 1 Min)

Romberg's integration method is ----- than Trapezoidal and Simpson's rule.

Answer ( Please select your correct option )

none of the given choices  
more accurate  
less accurate  
equally accurate

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Question No : 31 of 52 Marks: 1 (Budgeted Time 1 Min)

A fourth order ordinary differential equation can be reduced to a system of four ----- order ordinary differential equations.

Answer ( Please select your correct option )

First

Second

Third

Fourth

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Question No : 32 of 52 Marks: 1 (Budgeted Time 1 Min)

Given  $\frac{dy}{dt} = \frac{y-t}{y+t}$  with the initial condition  $y=1.02$  at  $t=0.02$ . Using Euler's method,  $y$  at  $t=0.04$ ,  $h=0.02$  is

Answer ( Please select your correct option )

3.0392

2.0392

1.0392

0.0392

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Question No : 33 of 52 Marks: 1 (Budgeted Time 1 Min)

In solving the differential equation  
 $y' = x + y$ ;  $y(0.1) = 1.1$   
 $h = 0.1$ , By Euler's method  $y(0.2)$  is calculated as

Answer ( Please select your correct option )

1.44  
1.11  
1.22  
1.33

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Question No : 34 of 52 Marks: 1 (Budgeted Time 1 Min)

To solve the ordinary differential equation  
 $3\frac{dy}{dx} + xy^2 = \sin x, y(0) = 5$ ,  
by Runge-Kutta 2<sup>nd</sup> order method, you need to rewrite the equation as

Answer ( Please select your correct option )

$\frac{dy}{dx} = \sin x - xy^2, y(0) = 5$   
 $\frac{dy}{dx} = \frac{1}{3}(\sin x - xy^2), y(0) = 5$   
 $\frac{dy}{dx} = \frac{1}{3}\left(-\cos x - \frac{xy^3}{3}\right), y(0) = 5$   
 $\frac{dy}{dx} = \frac{1}{3}\sin x, y(0) = 5$

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Question No : 35 of 52 Marks: 1 (Budgeted Time 1 Min)

In second order Runge-Kutta method,  $k_1$  is given by

Answer ( Please select your correct option )

$k_1 = hf(x_s, y_s)$

$k_1 = 2hf(x_s, y_s)$

$k_1 = 3hf(x_s, y_s)$

None of the given choices

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Question No : 36 of 52 Marks: 1 (Budgeted Time 1 Min)

In fourth order Runge-Kutta method,  $k_3$  is given by

Answer ( Please select your correct option )

$k_3 = hf(x_s + \frac{h}{3}, y_s + \frac{k_2}{3})$

$k_3 = hf(x_s - \frac{h}{2}, y_s - \frac{k_2}{2})$

$k_3 = hf(x_s - \frac{h}{3}, y_s - \frac{k_2}{3})$

$k_3 = hf(x_s + \frac{h}{2}, y_s + \frac{k_2}{2})$

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Question No : 37 of 52 Marks: 1 (Budgeted Time 1 Min)

In fourth order Runge-Kutta method,  $k_4$  is given by

Answer ( Please select your correct option )

$k_4 = hf(x_n + 2h, y_n + 2k_3)$

$k_4 = hf(x_n - h, y_n - k_3)$

$k_4 = hf(x_n + h, y_n + k_3)$

None of the given choices

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Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)

The truncation error in Adam's predictor formula is

Answer ( Please select your correct option )

$\frac{251}{720} h^5 \nabla^4 y_n'$

$\frac{251}{720} h^5 \nabla^4 y_{n+1}'$

$\frac{19}{720} h^5 \nabla^4 y_{n+1}'$

$\frac{19}{720} h^5 \nabla^4 y_n'$

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Question No : 39 of 52 Marks: 1 (Budgeted Time 1 Min)

In solving the differential equation  
 $y' = x^2 + 2xy$  ,  $y(0) = 1$   
 $h = 0.1$ , By Euler's method  $y(0.1)$  is calculated as

Answer ( Please select your correct option )

1  
2  
3  
4

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Question No : 40 of 52 Marks: 1 (Budgeted Time 1 Min)

In solving the differential equation  
 $y' = x^2 + 2y$  ;  $y(1) = 3$   
 $h = 1$ , By Euler's method  $y(2)$  is calculated as

Answer ( Please select your correct option )

4  
6  
8  
10

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Question No : 41 of 52 Marks: 2 (Budgeted Time 4 Min)

State the sufficient condition of convergence of the iterative solution to the exact solution

Answer (Please click here to Add Answer )

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Question No : 42 of 52 Marks: 2 (Budgeted Time 4 Min)

Evaluate the integral

$$\int_3^5 (\log x + 1) dx$$

Using Trapezoidal rule  
Take h=1

Answer (Please click here to Add Answer )

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Question No : 43 of 52 Marks: 2 (Budgeted Time 4 Min)

Write a formula for finding the value of  $k_1$  in Fourth-order R-K method.

Answer ( Please click here to Add Answer )

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Question No : 44 of 52 Marks: 2 (Budgeted Time 4 Min)

Write Adam-Moulton's Predictor formula for finding the solution of a differential equation.

Answer ( Please click here to Add Answer )

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Question No : 45 of 52 Marks: 3 (Budgeted Time 6 Min)

Obtain numerically the solution of  
 $y' = x^2 + 2x + y^2, y(0) = 1$   
Using Euler's method to find y at x=1, h=1

Answer ( Please click here to Add Answer )

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VU Examination System (CLIENT) VUTES 6.5 .... Fall 2012 (FinalTerm) .... - Windows Internet Explorer

Question No : 46 of 52 Marks: 3 (Budgeted Time 6 Min)

If  $f(2) = -2.6146$  and  $f(3) = 4.7610$ , then find the first approximation using the Regula-Falsi method

Answer ( Please click here to Add Answer )

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The screenshot shows a Windows Internet Explorer window with the following details:

- Title Bar:** VU Examination System (CLIENT) VUTES 6.5 .... Fall 2012 (FinalTerm) .... - Windows Internet Explorer
- Address Bar:** http://localhost/VUTES/client/Instructions.aspx
- Menu Bar:** File, Edit, View, Favorites, Tools, Help
- Toolbar:** Back, Forward, Stop, Refresh, Live Search
- Content Area:**
  - Question No:** 47 of 52
  - Marks:** 3 (Budgeted Time 6 Min)
  - Text:** If, in solving a given differential equation,  $y_0 = 1, y_1' = 1.1, y_2' = 1.2, y_3' = 1.3, h = 1$ . Then find  $y_4$  by Milne's Predictor formula.
  - Answer Area:** A large text input field with a toolbar above it. The toolbar includes icons for file operations (Save, Print, Copy, Paste), font selection (Normal, Arial, 12pt), and other text styling options.
- Footer:** Start Time: 12:06 PM, 119:00 Time Left, a progress bar at 47%, and a navigation bar with back, forward, and search buttons.
- Watermark:** MADE BY WAQAR SIDDHU

The process is repeated for Question 48 of 52, with similar layout and content.

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Question No : 49 of 52 Marks: 5 (Budgeted Time 10 Min)

Evaluate the integral  $\int_0^3 (x^2 + x) dx$   
Using Simpson's 3/8 rule

Answer ( Please click here to Add Answer )

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Question No : 50 of 52 Marks: 5 (Budgeted Time 10 Min)

Construct a backward difference table from the following values of x and y.

x	-1	0	1	2	3
y=f(x)	10	2	10	62	80

Answer ( Please click here to Add Answer )

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Question No : 51 of 52 Marks: 5 (Budgeted Time 10 Min)

From the following table of values, construct forward difference table.

x	1.00	1.05	1.10	1.15	1.20
y	1.0000	1.0247	1.0488	1.0724	1.0954

Answer ( Please click here to Add Answer )

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Question No : 52 of 52 Marks: 5 (Budgeted Time 10 Min)

Use Runge-Kutta Method of order four to find the values of  $k_1, k_2, k_3$  and  $k_4$  for the initial value problem

$$y' = \frac{1}{2}(2x^3 + y), y(0) = 2 \text{ taking } h = 0.1$$

Answer ( Please click here to Add Answer )

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