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## C.U.SHAH UNIVERSITY

## Summer Examination-2018

Subject Name : Computer Oriented Numerical Methods

Subject Code : 4CS02BCO2
Semester : 2

Date : 25/04/2018

Branch: B.C.A.
Time : 10:30 To 01:30
Marks : 70

Instructions:
(1) Use of Programmable calculator \& any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

## Q-1 <br> Attempt the following questions:

a) What is Iteration?
b) Enlist Iterative Methods. 1
c) Newton backward Interpolation Formula is used mainly to interpolate the values
of function $f(X)$ near the middle of tabular value. State True or False
d) Putting $\mathrm{n}=1$ in the Newton -Cote's quadrature formula following rule is

Obtained
(a) Simpson's rule (b) Trapezoidal rule (c) Simpson's 3/8rule (d) none of these
e) A graph is a collection of $\qquad$
(a) Row and columns
(b) Vertices and edges
(c) Equations
(d) none of these
f) A tree with $n$ vertices has $\qquad$ edges.
(a) $n$ (b) $n+1$ (c) $n-2$ (d) $n-1$
g) What is liner equation?
h) What is non-linear equation?
i) The order of convergence in Bisection method is
(a) linear (b) quadratic
(c) zero
(d) none of these
j) The order of convergence in Newton - Raphson method is
(a) 2 (b) 3 (c) 0 (d) none of these
k) A partial order relation
is transitive, reflexive and
(a) antisymmetric (b) bisymmetric (c) antireflexive (d) asymmetric
I) Write the formula for Netwons' Forward Interpolation Method.
m) Write the formula for Netwons' Backward Interpolation Method.1
n) A tree with $n$ vertices has $\qquad$ edges.
(a) n (b) $\mathrm{n}+1$
(c) n2
(d) $n-1$

## Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions
(A) Use Lagrange's Interpolation Formula to find the value of $y$ when $x=10$, if the following values of x and y are given:

| X | 5 | 6 | 9 | 11 |
| :--- | :--- | :--- | :--- | :--- |
| Y | 12 | 13 | 14 | 16 |

(B) Find the positive root of $\mathrm{x}^{3}+2^{\mathrm{x} 2}+10 \mathrm{X}-20=0$ by Newton-Raphson method.

Q-3 Attempt all questions
(A) Solve the following system of equations by Gauss Seidel Method:
$6 x+y+z=105,4 x+8 y+3 z=155,5 x+4 y-10 z=65$
(B) Use the fourth - order Runge Kutta method to solve dy $/ \mathrm{dx}=\mathrm{x}^{2}+\mathrm{y}^{2}, \mathrm{y}(0)=1$, Evaluate the value of Y when $\mathrm{X}=0.1$

Q-4 Attempt all questions
(A) Draw the graph where $\mathrm{V}=\{1,2,3,4\}$ and $\mathrm{E}=\{\mathrm{e} 1, \mathrm{e} 2, \mathrm{e} 3, \mathrm{e} 4, \mathrm{e} 5\}, \mathrm{e} 1=\mathrm{e} 5=(1,2)$
$\mathrm{e} 2=(4,3), \mathrm{e} 4=(2,4)$ and e3=(1,3)
(B) Use the Euler method to solve $d y / d x=x^{2}+y^{2}, y(0)=1$, Evaluate the value of $Y$ when $\mathrm{X}=0.1$

## Q-5 Attempt all questions

(A) Draw all non-isomorphic graph on 2 and 3 vertices
(B) Find out the value of Y when $\mathrm{X}=18$ Using Netwon's Forward interpolation method.

| X | 5 | 10 | 15 | 20 |
| :--- | :--- | :--- | :--- | :--- |
| Y | 10 | 12 | 14 | 16 |

Q-6 Attempt all questions
(A) Solve
the following system of equations by Gauss Elimination Method:

$$
\begin{aligned}
& 5 x-2 y+3 z=18 \\
& X+7 y-3 z=-22 \\
& 2 x-y+6 z=22
\end{aligned}
$$

(B) Explain Isomorphism with diagram
(A) What is Graph? Explain Vertices and Edges with Diagram
(B) Find Complement of each element of Lattice( S30,GCD,LCM, 1,30)

Q-8 Attempt all questions
(A) Find all the mint terms of a Boolean Algebra with three variables

X1,X2,X3.........
(B) Derive the Formula for Simpson's $1 / 3$ rule.

