

JAYFEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

M.Tech-II Semester (CSE-DS)

COURSE CODE (CREDITS): 22M1WCI231 (3)

MAX. MARKS: 35

COURSE NAME: Advanced Computational Techniques

COURSE INSTRUCTORS: Dr. Anita

MAX. TIME: 2 Hours

*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

*(d) Scientific Calculator is allowed*

Q1 Find the first derivative of  $f(x)$  at  $x=0.4$  from the following table: (5) CO4

X	0.1	0.2	0.3	0.4
F(X)	1.10517	1.22140	1.34986	1.49182

Q2 Given the table of values, estimate  $y''$  (1.3): (5) CO5

X	1.3	1.5	1.7	1.9	2.1	2.3
Y	2.0648	2.6599	2.3333	1.9922	1.6442	1.2969

Q3 Using cubic spline interpolation, find the value of  $y$  at  $x=1/2$ , for the following data: (5) CO8

(0,1)	(1,2)	(2,9)	(3,28)
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Q4 Using Newton's divided difference formula, evaluate  $f(15)$  from the following table of values (5) CO8

X	4	5	7	10	11	13
F(X)	48	100	294	900	1210	2028

Q5 Fit a straight line of the form  $y=ax+b$ , to the following data by the method of moments (5) CO5

X	2	3	4	5
Y	27	40	55	68

**Q6** Find the largest eigen value and the corresponding eigenvector of the matrix (5) CO7

3    1    4  
0    2    6  
0    0    5

By power method at the end of 6<sup>th</sup> iteration, taking unit vector as the initial vector

**Q7** Using Gaussian elimination method, Find the inverse of the matrix? (5) CO7

0    1    2  
1    2    3    \  
3    1    1

All the Best

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