B.E. (Computer Engineering) Fourth Semester (C.B.S.)

Numerical Computational Techniques

P. Pages : 2 **NRT/KS/19/3391**

Time : Three Hours * 0 7 7 9 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain false position method. Graphically. **6**

b) Find the positive root of the equation x - 2sin x = 0 using Newton Raphson method correct up to three decimal places. **7**

OR

2. a) Find the root of the equation tanx + tanhx = 0 using Regula falsi method up to 7 itration. **7**

b) Find $\sqrt{29}$ and $x = (5-x)^{1/2}$ by using Bisection method correct up to 3 decimal places. **6**

3. a) The function y = sinx is tabulated below. **6**

x	0	$\pi/4$	$\pi/2$
y = sinx	0	0.70711	1.0

Find the value of sing $\pi/6$

b) From the data given below, find the number of students whose weight is between 60 and 70. **7**

Weight in Lbs :	0-40	40-60	60-80	80-100	100-120
No. of students :	250	120	100	70	50

OR

4. a) Solve the equations, Find A^{-1} **6**
$3x + y + 2z = 3$; $2x - 3y - z = -3$;
$x + 2y + z = 4$

b) Apply Gauss Jordan method, solve the equation $10x + y + z = 12$; **7**
$2x + 10y + z = 13$; $x + y + 5z = 7$.

5. a) Derive the formula of Simpson's 1/3 rule with geometrical interpretation. **7**

b) Find f '(4) from following data **6**

x :	0	2	5	1
f(x) :	0	8	125	1

OR

6. a) Divide the range into ten equal parts. Evaluate $\int_0^{\pi} \text{Sin}\, x\, dx$ by Simpson's rule verify your answer with integration. **7**

b) A curve passes through the points (1,2) (1.5, 2.4) (2.0, 2.7) (2.5, 2.8) (3,3) (3.5, 2.6) and (4.0, 2.1) obtain the area bounded by the curve, the x - axis and x = 1 and x = 4 **6**

7. a) What are different types of probability distributions? Explain with example. **7**

b) In a certain distribution the first four moments about mean 5 are 2, 20, 40, 50 calculate β_1 and β_2 state whether the distribution is leptokurtic or platykurtic. **7**

OR

8. a) An urn contains 8 white and 3 red balls. If two balls are drawn at random find the probability that **7**
i) Both are white ii) Both are red iii) One is of each colour.

b) Calculate Mean, Median and mode from the following data **7**

Class Interval :	10-20	20-30	30-40	40-50	50-60
Frequency :	8	12	24	10	6

9. a) Define correlation and state the properties of coefficient of correlation. **6**

b) Fit a straight line to the following data also estimate of y at x = 70. **8**

x :	71	68	73	69	67	65	66	67
y :	69	72	70	70	68	67	68	64

OR

10. a) The values of the same 15 students in two subjects A and B are given below the two numbers within the brackets denoting the rank of the same students in A and B respectively. **7**
(1, 10) (2,7) (3,2) (4,6) (5,4) (6,8) (7,3) (8,1) (9,11) (10,15) (11,9) (12,5) (13,14) (14,12) (15,13) Use spearman's formula to find the rank correlation coefficient.

b) Fit a trigonometric function y = A sin $(wx+\phi)$ and Determine A and ϕ **7**

11. What is contingency table? Analyze given contingency table by using χ^2 – test using both methods. **13**

Team	Very good	Good	Satisfactory	Poor
A	23	20	19	21
B	24	19	22	18

OR

12. a) Find the F - value of following observation **7**
1, 3, 5, 7, 9 and
5, 9, 3, 8, 3

b) Analyze given data using T - test **6**

X	4	5	8	8	6
Y	3	5	6	6	3

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