



S. Y. B.Tech. (Computer Science and Engineering) (Sem-III)
MID SEMESTER EXAMINATION, SEPTEMBER 2019
Computational Mathematics (UCSE0301)

Day and Date: Tuesday, 17/09/2019
Time: 10:00 AM to 12:00 Noon

PRN No. :

Max Marks- 50

Instructions:

IMP: Verify that you have received question paper with correct course, code, branch etc.

- i) All questions are compulsory.
- ii) Figure to the right indicate full marks.
- iii) Assume suitable data wherever necessary.

	Marks	CO's	B.L	PO
Q.1 Attempt any three	18	CO6	IV	PO1
A Apply Gauss Jordon method to solve the equations: $2x + y + z = 10; 3x + 2y + 3z = 18; x + 4y + 9z = 16$	6			
B Apply Factorization method to solve the equations: $2x - 3y + 4z = 7; 5x - 2y + 2z = 7; 6x - 3y + 10z = 23$	6			
C Solve the system of non-linear equations: $x^2 + 2y = 15; 2x + y^2 = 17$ with initial approximations $x_0 = 3.5; y_0 = -1.8$ Carry out one iteration.	6			
D Determine the largest eigen value and the corresponding eigen vector of the following matrix using the power method: $A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$	6			
Q.2 Attempt any two	16	CO3	III	PO1
A By using the bisection method and Newton's iterative method, find an approximate root of the equation $x \log_{10} x = 1.2$	8			
B Evaluate $\int_0^{\frac{\pi}{2}} \sqrt{\sin x} dx$ by using i) Trapezoidal rule ii) Simpson's 1/3 rd rule, iii) Simpson's 3/8 th rule.	8			

- C A river is 80 m wide. The depth d in meters at a distance x meters from one bank is given by the following table. 8

x	0	10	20	30	40	50	60	70	80
d	0	4	7	9	12	15	14	8	3

Find approximately the area of the cross-section.

Q.3 Attempt any two

- A In a bolt factory machines A, B, and C manufactures respectively 25, 35 and 40 percent of the total, of their output 5, 4 and 2 percent are defective bolts respectively. A bolt is selected at random from the product and is found to be defective. What is the probability that it was manufactured by machines A, B, or C? 16
8
- B A set of 8 coins were tossed 256 times to produce the following distribution, 8

Number of heads	0	1	2	3	4	5	6	7	8
Frequency observed	2	6	24	63	64	50	36	10	1

Fit a binomial distribution if 1) The coin is unbiased; 2) the coin is biased.

- C A book of 480 pages contains 480 misprints. Assuming that the number of misprints in a page is having Poisson distribution. 8

Find the probability that a page contains

- 1) Exactly 3 misprints.
- 2) At least 3 misprints.
- 3) At most 4 misprints.
