

1. Answer any **Two** questions: **2 × 10 = 20**

- (a) Write a program in C to find $A + B^t$, given any two square matrices A and B .
- (b) Write a program in C to find the second largest value in an array of 10 numbers.
- (c) Write a program in C to find S , where,

$$S = \int_0^{\frac{\pi}{2}} \sqrt{1 - 0.162 \sin^2 \phi} d\phi$$

using Simpson's one-third rule, taking 8 intervals.

2. Answer any **Two** questions: **2 × 15 = 30**

- (a) Use suitable interpolation formula to find $f(0)$ using the following table:

| | | | | |
|--------|----|----|----|----|
| x | -2 | -1 | 2 | 4 |
| $f(x)$ | -9 | -1 | 11 | 69 |

- (b) Use the method of iteration to compute a positive root of the equation,
 $x^2 - x - 0.1 = 0$
correct up to three significant figures.

- (c) Solve, by Gauss-Seidel iterative method:

$$8.467x_1 + 5.137x_2 + 3.141x_3 + 2.063x_4 = 29.912$$

$$5.137x_1 + 6.421x_2 + 2.617x_3 + 2.003x_4 = 25.058$$

$$3.141x_1 + 2.617x_2 + 4.128x_3 + 1.628x_4 = 16.557$$

$$2.063x_1 + 2.003x_2 + 1.628x_3 + 3.446x_4 = 12.690$$

correct up to four significant figures.

END