MMSEC-2

Sl.No. :

Total No. of Pages : 3

Fourth Semester M.Sc. Degree Examination, November - 2024
(SLM Scheme) (CBCS)
MATHEMATICS
SEC : Algorithms and Computations

Time : 1½ Hour **Max. Marks : 40**

SECTION - A

I. Answer any five questions : **[5 × 2 = 10]**

Q1) Write flow chart to print addition of 2 numbers.

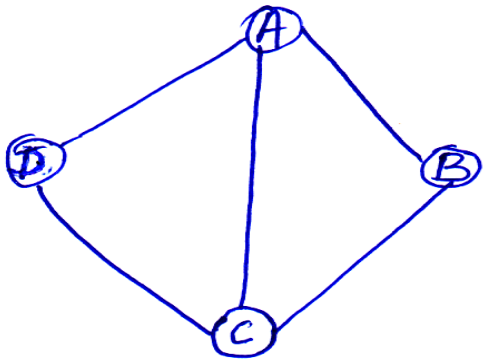
Q2) Mention types of computer languages.

Q3) Write Newton's forward interpolation formula and Newton's backward interpolation formula.

Q4) Explain Trapezoidal rule.

Q5) Define a graph. Mention different types of graphs.

Q6) Define spanning tree. Obtain all possible spanning trees for the following graph.



Q7) Write a note on complexities of an algorithm.

SECTION - B

II. Answer any four questions : **[4 × 5 = 20]**

Q8) Write a neat block diagram, explain the functionalities of a computer.

Q9) Solve the following, system of equations using Gauss Jacobi method $2x+5y=16$; $3x+y=11$.

Q10) Use Newton divided difference formula and evaluate f(6) given.

x	5	7	11	13	21
$f(x)$	150	392	1452	2366	9702

Q11) Evaluate $\int_0^1 e^x dx$ by Simpson's $1/3^{rd}$ Rule.

Q12) Explain the steps involved in Dijkstra's Algorithm in finding the shortest path between two vertices.

Q13) Write the advantages and disadvantages of Divide and Conques. Method.

SECTION - C

III. Answer any one question : **[1 × 10 = 10]**

Q14) Solve the following by using the methods.

i) By Gauss - Elimination method

$x+2y+3z=6$

$2x+3y-z=7$

$3x+2y+9z=14$

ii) By Gauss Jordan method

$x+2y-3z=2$

$6x+3y-9z=6$

$7x+14y-21z=13$

Q15) Compute the value of $\frac{2}{\sqrt{\pi}}\int_0^x e^{-x^2}\,dx$ when $x = 0.6538$ by using.

i) Gauss's forward formula

ii) Gauss's backward formula

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