

Total No. of Questions : 4]

SEAT No. :

PE-547

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[6578]-20

S.E. (Computer Engineering)/(A.I&D.S/Comp.Sc.) (Insem.)

FUNDAMENTALS OF DATA STRUCTURES

(2019 Pattern) (Semester - III) (210242)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :

- 1) Answer Q.1 or Q.2, Q.3 or Q.4.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Make suitable assumptions if necessary.
- 4) Figures to the right indicate full marks.

Q1) a) Define the following terms with the help of an example [4]

- i) Data Structure
- ii) Abstract Data Types
- iii) Algorithm
- iv) Flowchart

b) Define Time and Space complexity and Explain the Asymptotic notations used for time complexity? [5]

c) State different algorithmic strategies and describe any two greedy algorithm strategies with example? [6]

OR

Q2) a) Write algorithm to find factorial of a number. Draw the flowchart for the same. [5]

b) Define the term data structure? Give complete classification of data structure with an example? [5]

c) Explain following algorithm strategies with example [5]

- i) Tower of Hanoi
- ii) Binary search

P.T.O.

**Q3) a)** Represent following polynomial using Array [5]

i)  $4x^2 + 5xy^2 + 2y^3 - 15$

ii)  $x^5y^4 + 6x^4y^3 + 3x^2y + 27$

b) State advantages and disadvantages of sequential organization of Data structure? [4]

c) Explain row major and column major representation of array in computer memory with example? Each element of an array A[10][12] requires 4 bytes of storage Base address of data is 1000. Determine the location of A[5][5] when array is stored as [6]

i) Row major

ii) Column major

OR

**Q4) a)** Explain with help of an example how to convert 2D presentation of matrix to sparse representation and write pseudo code for it? [4]

b) Describe the addition of two sparse matrices with the help of an example and write pseudo code for it? [6]

c) State the different types of operations that can be performed on one dimensional array? Write pseudo code for inserting 5 elements in array and deleting one element from array? [5]

