

Total No. of Questions : 4]

SEAT No. :

PE-356

[Total No. of Pages : 2

[6580]-545

B.E. (Computer Engineering) (Insem.)

DESIGN AND ANALYSIS OF ALGORITHMS

(2019 Pattern) (Semester - VII) (410241)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Answer four questions Q1 or Q2, Q3 or Q4.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Assume suitable data if necessary.

Q1) a) Why correctness of the algorithm is important? Define loop invariant property and prove the correctness of finding summation of n numbers using loop invariant property. [7]
b) Explain in detail any 4 problem solving strategies. [8]

OR

Q2) a) What is iterative algorithm? Explain iterative algorithm design issues using examples. [7]
b) How to prove that an algorithm is correct? How to prove the correctness of an algorithm using counter example? Give suitable example. [8]

Q3) a) Explain P, NP, NP-Hard and NP-Complex problems with example. [7]
b) What is best, average and worst case Analysis of algorithms? Analyse the following algorithm Best, Average and worst case. [8]

```
void sort (int a, int n)
{
    int i, j;
    for (i=0; i<n; i++) {
        j = i -1;
        key = a[i];
        while (j >= 0 && a[j] > key) {
            a[j+1] = a[i];
            j--;
        }
    }
}
```

P.T.O.

OR

- Q4)** a) What is NP - complete class problems? How would you prove vertex cover problem is NP - complete problem. [8]
- b) Explain 3 - SAT problem using an example. [7]

