DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
BLOCK EXAMINATION (REGULAR)
SUBJECT: (IT 509) Design And Analysis of Algorithm

Examination	**: B.TECH Semester - V**	**Seat No.**	**:**
Date	**: 11/11/2017**	**Day**	**: Saturday**
Time	**: 11:00 to 12:15**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

(a) What is an Algorithm? How to prove the correctness of an Algorithm? **[2]**

(b) Arrange the following the following asymptotic notations in increasing order **[2]**
$O(\sqrt{n}), O(n^2), O(\log n)\ O(n \log n), O(n!), O(a^n)$

(c) Solve the recurrence : $T(n) = 2T(n/4) + \sqrt{n}$ **[2]**

(d) "During Solving the Dijkstra's algorithm, if we consider the edge length as negative also it does not work correctly." – Justify your answer. **[2]**

(e) What is the difference between NPC and NPH? **[2]**

(f) "Greedy Algorithms may not give optimum solution" state True or False with justification **[2]**

Q.2 Attempt the following questions. **[12]**

(a) Find the complexity of the following algorithm

```
Insert(a, n)
{  i=n ; item =a[n];
   While( (i>1) and (a[i/2]<item)) do
        a[i] = a[i/2]; i=(i/2);
    return;
} NOTE: All " / "(division) operations are integer divisions
```

(b) Solve following recurrence: $t_n = 0$ if n=0

$$t_n = 5 \text{ if } n=1 \quad \text{and} \quad t_n = 3t_{n-1} + 4t_{n-2} \text{ otherwise}$$

Q.3 (a) Find the edit distance between string x="SUNDAY" and y="SATURDAY" **[6]**

(b) Find the minimum spanning tree for the graphs shown below using Prim's algorithm **[6]**