1) [illegible]

0, 6, 5, 4, 3, 2, 1, 0, 6, 5, 4, 3, ...

[illegible]

2) [illegible]

[illegible]	[illegible]	[illegible]
P1	0	5
P2	2	7
P3	4	6
P4	7	2

3) [illegible] n [illegible] ($n \geq 2$) [illegible] S [illegible] Q [illegible] Q [illegible] T [illegible] n, S, [illegible] T.

[illegible] [illegible] [illegible]

[illegible]

1) a) [illegible] $f \in O(g)$ ([illegible] - [illegible]).

b) [illegible] $f \in O(n)$, [illegible]

$$f(n) = \begin{cases} n^2 - n, & n \le \text{[illegible]} \\ 5n + 7, & n > \text{[illegible]}\ \text{[illegible]}\ n\ \text{[illegible]} \\ 4n, & n > \text{[illegible]}\ \text{[illegible]}\ n\ \text{[illegible]} \end{cases}.$$

2) [illegible] [illegible]

[illegible]

a) [illegible]

b) [illegible]

c) [illegible]

d) [illegible] [illegible] [illegible]

3) [illegible]

```
    int CountKey(treeptr *p, int keyval);
```

[illegible]

[illegible] as a leaf node [illegible].

Theory Exam

Answer **ANY TWO** of the following three questions:

1. Provide a context-free grammar that generates the following language over Σ = {0,1}:

   $$\{ \quad = 0^{*}1^{*} : | \quad | \text{ is odd}\}$$

2. A clique in an undirected graph is a subgraph wherein every two nodes are connected by an edge. Consider the language:

   3CLIQUE }= { P r o Y T W Q U E }