Total Marks: 20   **Time: 1hr**

1. Write about different phases of a compiler. Show the translation of the assignment statement **position=initial + rate * 60** by different phases of a compiler.   4 + 2 = 6

2. What is parse tree?   1

3. Show the annotated parse tree to covert the expression 9-5+2 into postfix using the following grammar.   3

$$expr \longrightarrow expr + term$$
$$expr \longrightarrow expr - term$$
$$expr \longrightarrow term$$
$$term \longrightarrow 0|1|2|.....|9$$

4. What is lookahead?   1

5. How can we eliminate left recursion from a left recursive grammar.   2

6. Describe the structure of a lex program.   3

7. Convert the following NFA to DFA-   4