Course Name: (1) : Selective Course (2) (Compilers)

Program: Computer and Control Eng. (CCE 389) Program Academic Year: 2022-2023

Level: Third Year Semester: Second term

Sheet No. (1) Subject: Compiler Design

Q1: What is Compiler ?

Q2:What is the difference between a compiler and an interpreter?

Q3:What are Language Processors?

Q4: What are compiler phases ?

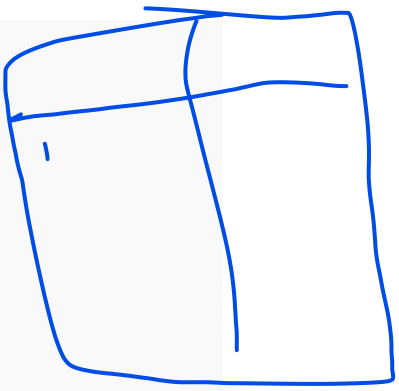
Q5:Explain Language Processing system in details.

Q6: Define token, pattern, and lexeme.

Q7: Determine token and lexeme in this program

Count number of tokens :

```
int main()
{
  int a = 10, b = 20;
  printf("sum is :%d",a+b);
  return 0;
}
```



Best Regards,
Dr. sahar kamal

Q7: Determine token and lexeme in this program

```
#include<iostream>
// example
int main(){
      int a, b;
      a = 7;
      return 0;
}
```

Q8: Describe the languages denoted by the following regular expressions:

- $\Sigma = \{a, b\}$

1. a|b denotes ……
2. (a|b)(a|b) denotes ……
3. a* denotes …….
4. (a|b)* denotes……
5. a|a*b denotes ……
6. a*|a*b denotes …….
7. $(ab^*)^+$ denotes ……

a* = { , a, aa, aaa, ...} union b* = { , b , bb, bbb, bbbb, ...
{ , a, aa, aaa, ... , b , bb, bbb, bbbb, }

a*b = {a, b, ab, aab ,aaab, aaaab, ...}

, a, aa, aaa, ..., b, ab, aab, aaab, aaaab, ...

a, ab , abb , abbb, ...
a, aa, aaa, aaaa, ..., ab, abab, ababab, ..., abb, abbabb, abbbabbb, ...

Q9: Describe the languages denoted by the following regular expressions:

b* = {E, b, bb, bbb, ...}
{E,a}
{E, b, bb, bbb, bbbb, ...a, ab, abb, abbb, abbbb, ...}*
{E, b, bb, bbb, ..., bb ,bbbb, bbbbbb, ..., ..., a, aa, aaa, aaaa, ...,
ab, abab, ababab, ..., abb, abbabb, abbabbabb, ..., abbb,
abbbabbb

a) $\mathbf{a}(\mathbf{a}|\mathbf{b})^*\mathbf{a}$. (a, b)* = , a, aa, aaa, ..., b, bb, bbb, ...
aa , aa a, aa aa, aa aaa, aa aaaa, ...

b) $((\epsilon|\mathbf{a})|\mathbf{b}^*)^*$

c) $(\mathbf{a}|\mathbf{b})^*\mathbf{a}(\mathbf{a}|\mathbf{b})(\mathbf{a}|\mathbf{b})$.

d) $\mathbf{a}^*\mathbf{b}\mathbf{a}^*\mathbf{b}\mathbf{a}^*\mathbf{b}\mathbf{a}^*$.

Q10:

a) All strings of a's and b's with an even number of a's. aa*b*, aab*

b) All strings of a's and b's with and odd number of b's. ab*b+ = ab, abbb, abbbbb, ...

c) All strings of a's and b's that contain at least two b's.

d) All strings of a's and b's that contain at most two b's.

e) All strings of a's and b's that contain just two or three b`s