All three programs have to be performed (5 marks for each output)

a. Write a program to create your own 'C' library using macros that can find the area of geometrical shapes (any 4).
b. Write a Lex program to show the vowels and consonants of a token
c. Write a program to convert the given computation into three address code.

*x = (a+b) * (c-d);*

All three programs have to be performed (5 marks for each output)

a. Write a program to create your own 'C' library using macros for conversions.
(metre ⇔ feet, litre ⇔ cubic feet, °C ⇔ °F)
b. Write a Lex program to count the number of words in a source program.
c. Write a program to convert the given computation into three address code.

*x = a+ b*c -d;*

All three programs have to be performed (5 marks for each output)

a. Write a program to create your own 'C' library using macros for conversions.
(binary ⇔ decimal, binary ⇔ hexadecimal)
b. Write a Lex program to identify tokens
c. Write a program to convert the given computation into three address code.

*x = a*b/c+d;*

All three programs have to be performed (5 marks for each output)

a. Write a program to create your own 'C' library using macros to generate series.
(Fibonacci, prime numbers, leap years)
b. Write a Lex program to count the number of tokens with uppercase characters.
c. Write a program to convert the given computation into three address code.

*x = a-b*c/d;*

All three programs have to be performed (5 marks for each output)

a. Write a program to create your own 'C' library using macros to find the properties of a given number n – factorial of n, sum of natural numbers till n, and factors of n.
b. Write a Lex program to show the count the number of lines in the source program.
c. Write a program to convert the given computation into three address code.

*x = a-b/c*d;*

Both programs have to be performed (10marks for part a, 5 marks for part b)

a. Consider the following program, Display the Pass-1 of the Program

```
START    501
A  DS 1
B  DS 1
C  DS 1
READ A
READ B
MOVER   AREG, A
ADD      AREG, B
MOVEM AREG, C
PRINT C
END
```

b. Write a Lex program to count the number of words in the source program. (05 marks)

Both programs have to be performed (10marks for part a, 5 marks for part b)

a. For the given program, Display the Pass-2 by taking intermediate code as an input

Assembly program	LC	**Intermediate code (PASS-1)**
START 501		**(AD,01) (c,501)**
A DS 1	501	**(S,0) (DL,0) (c,1)**
B DS 1	502	**(S,1) (DL,0) (c,1)**
C DS 1	503	**(S,2) (DL,0) (c,1)**
READ A	504	**(IS,09) (S,0)**
READ B	505	**(IS,09) (S,1)**
MOVER AREG, A	506	**(IS,04) (RG,01) (S,0)**
ADD AREG, B	507	**(IS,01) (RG,01) (S,1)**
MOVEM AREG, C	508	**(IS,05) (RG,01) (S,2)**
PRINT C	509	**(IS,10) (S,2)**
END	510	**(AD,02)**

b. Write a Lex program to count the number of tokens with uppercase characters.

All three programs have to be performed (5 marks for each output)

a. Write a program to create your own 'C' library using macros to find the properties of a given number n – factorial of n, sum of natural numbers till n, and factors of n.
b. Write a Lex program to identify the expression is valid or not. (Eg. 2+3 is valid expression and 4+ is invalid expression)
a. Consider the following Three address code and display Triples

   f=c+d

   e=a-f

   g=b*e

Both programs have to be performed (10marks for part a, 5 marks for part b)

a. Write a program to remove left recursion from a given context free grammar.
   Nonterminal ={S,L} terminal={(, x, , ,) }
   S→(L)/x
   L→L,S/S
b. Write a lex program to identify all the keywords (if, else, while etc.)

Both programs have to be performed (10marks for part a, 5 marks for part b)

a. Write a program to optimize the given three address code.

   T1= 5*3+10 // Constant folding
   T3=T1 //variable propagation
   T2=T1+T3
   T5=4*T2 // common sub-expression elimination
   T6=4*T2+100

b. Write a program to count number of characters, words, sentences present in input using LEX.

Both programs have to be performed (10marks for part a, 5 marks for part b)

a. Write a program to generate the three address code of
   x = a*b – a*b + a*b;
a. Write a program to count number of lines, numbers and blank spaces present in input using LEX.

Both programs have to be performed (10marks for part a, 5 marks for part b)

a. Find the First() and Follow() sets of each non-terminal.
   S → Xb | XS
   X→ a | b
b. Write a program to generate the three address code of
   pi = 3.145;
   x = a * pi * 180 + b * pi * 2;

Both programs have to be performed (10marks for part a, 5 marks for part b)

a. Find the First() and Follow() sets of each non-terminal.
   S → S | a | ε

b. Consider the following Three address code and display Quadruples
   f=c+d
   e=a-f
   g=b*e
