**SYSTEM SOFTWARE AND OPERATING SYSTEM LABORATORY**
**[As per Choice Based Credit System (CBCS) scheme]**
**(Effective from the academic year 2017 - 2018)**
**SEMESTER – VI**

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| Subject Code | 17CSL67 | IA Marks | 40 |
| Number of Lecture Hours/Week | 01I + 02P | Exam Marks | 60 |
| Total Number of Lecture Hours | 40 | Exam Hours | 03 |

**CREDITS – 02**

**Description (If any):**

Exercises to be prepared with minimum three files (Where ever necessary):

i. Header file.
ii. Implementation file.
iii. Application file where main function will be present.

The idea behind using three files is to differentiate between the developer and user sides. In the developer side, all the three files could be made visible. For the user side only header file and application files could be made visible, which means that the object code of the implementation file could be given to the user along with the interface given in the header file, hiding the source file, if required. Avoid I/O operations (printf/scanf) and use ***data input file*** where ever it is possible

**Lab Experiments:**

1.

a) Write a LEX program to recognize valid ***arithmetic expression.*** Identifiers in the expression could be only integers and operators could be + and *. Count the identifiers & operators present and print them separately.

b) Write YACC program to evaluate ***arithmetic expression*** involving operators: +, -, *, and /

2. Develop, Implement and Execute a program using YACC tool to recognize all strings ending with ***b*** preceded by ***na's*** using the grammar $a^n\ b$ (note: input ***n*** value)

3. Design, develop and implement YACC/C program to construct ***Predictive / LL(1) Parsing Table*** for the grammar rules: $A \rightarrow aBa$ , $B \rightarrow bB \mid \varepsilon$. Use this table to parse the sentence: ***abba$***

4. Design, develop and implement YACC/C program to demonstrate ***Shift Reduce Parsing*** techniquefor the grammar rules: $E \rightarrow E+T \mid T$, $T \rightarrow T*F \mid F$, $F \rightarrow (E) \mid id$ and parse the sentence: ***id + id * id***.

5. Design, develop and implement a C/Java program to generate the machine code using ***Triples*** for the statement $A = -B * (C + D)$ whose intermediate code in three-address form:

$T1 = -B$
$T2 = C + D$
$T3 = T1 + T2$
$A = T3$

6. a) Write a LEX program to eliminate ***comment lines*** in a ***C*** program and copy the

resulting program into a separate file.

b) Write YACC program to recognize valid ***identifier, operators and keywords*** in the given text (*C program*) file.

7. Design, develop and implement a C/C++/Java program to simulate the working of Shortest remaining time and Round Robin (RR) scheduling algorithms. Experiment with different quantum sizes for RR algorithm.
8. Design, develop and implement a C/C++/Java program to implement Banker's algorithm. Assume suitable input required to demonstrate the results.
9. Design, develop and implement a C/C++/Java program to implement page replacement algorithms LRU and FIFO. Assume suitable input required to demonstrate the results.

**Study Experiment / Project:**

**NIL**

**Course outcomes:** The students should be able to:

- Implement and demonstrate Lexer's and Parser's
- Implement different algorithms required for management, scheduling, allocation and communication used in operating system.

**Conduction of Practical Examination:**

- All laboratory experiments are to be included for practical examination.
- Students are allowed to pick one experiment from the lot.
- Strictly follow the instructions as printed on the cover page of answer script
- Marks distribution: Procedure + Conduction + Viva:**15 + 70 +15 (100)**
- **Change of experiment is allowed only once and marks allotted to the procedure part to be made zero**

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