KADI SARVA VISHWAVIDHYALAYA

B.E. Semester-V November-2016 (CE)

Date: 17/11/2016 **Total Marks: 70**

Time: 10:30 AM to 1:30 PM **Subject Code: CE504**

SYSTEM SOFTWARE

Instructions:

1. Answer each section in separate Answer sheet.
2. Use of scientific calculator is permitted.
3. All questions are **Compulsory**.
4. Indicate **clearly**, the options you attempt along with its respective question number.
5. Use the last page of main supplementary of **rough work**.

Section - I

Q-1 (All compulsory)

(A) Define the following terms: (i) language translator (ii) detranslator (iii) preprocessor (iv) language migrator (v) language processor [5]

(B) Explain two models for program execution. [5]

(C) Consider the statement: c = (a – b)*d; [5]
Explain how lexical and syntax analysis phases process this statement.

OR

(C) Consider the statements: [5]
int a, b; float c, d;
c = (a – b)*d;
Show the contents of the symbol table and intermediate code.

Q-2 Answer the following questions.

(A) List out various search data structures and explain binary search organization in detail. [5]

(B) Draw DFA for the following regular expression: [5]
All the strings of *a* and *b* not containing two consecutive *a*

OR

(A) List out various allocation data structures and explain extended stack model in detail. [5]

(B) Draw DFA for recognizing unsigned integers and unsigned real numbers. [5]

Q-3 Answer the following questions.

(A) What is ambiguity? Write unambiguous grammar of arithmetic operators and parse the following string using it: id – id * id [5]

(B) Construct LL(1) parse table for the following grammar: [5]

E ::= T E' E' ::= +TE' | ε

T ::= VT' T' ::= *VT' | ε

V ::= <id>

OR

(A) Explain top-down parsing without backtracking with example. [5]

(B) Define simple precedence grammar and operator precedence grammar with examples. [5]

Section - II

Q-4 (All compulsory)

(A) Explain advanced assembler directives with examples. [6]

(B) Can the operand expression in an ORIGIN statement contain forward references? If so, outline how the statement can be processed in a two pass assembly scheme? [4]

(C) Perform pass-I on following assembly code and give the appropriate output: [5]

```
      START 100
A     DS 3
      ORIGIN A+5
L1    MOVER AREG, B
      MUL AREG, C
      ADD AREG, ='5'
      SUB AREG, ='10'
D     EQU A+1
      LTORG
L2    MOVEM AREG, D
      ADD BREG, ='10'
      ORIGIN L1-2
C     DS 1
      ORIGIN L2+2
      STOP
B     DC '19'
      END L1
```

OR

(C) Write an assembly program to find *N*!. [5]

Q-5 Answer the following questions.

(A) Write a macro that adds *n* numbers of the first array with *n* numbers of the second array and stores the results in the third array. (specify arrays as macro parameters) [5]

(B) Generate all the tables after processing of macro definition for the macro given in Q-5 (A) above. Consider AREG as default register used by the macro. [5]

OR

(A) Explain nested macro call and its expansion with example. [5]

(B) Explain any two advanced macro facilities with examples. [5]

Q-6 Answer the following questions.

(A) Differentiate between compiler and interpreter for higher level languages. [5]

(B) Explain any two types of programs based on loading capability. [5]

OR

(A) Explain pure and impure interpreters with examples. [5]

(B) Explain object module of a program with example. [5]

-------- All the Best---------

Enrollment No.												

KADI SARVA VISHWAVIDHYALAYA

B.E. Sem - V (CE) EXTERNAL EXAM. NOV- 2014

Date : 20-11-2014 **Subject : System Software**
Time : 3 hrs **Subject Code : CE 504**
Instructions: **Max. Marks : 70**

1) **Write both Sections in separate Answer Sheets.**
2) **Assume suitable data where necessary.**
3) **Figures to the right indicate full marks.**
4) **Indicate clearly, the options you attempt along with its respective Que. No.**

SECTION - I

Q-1 Answer the following questions: **[15]**

(a) Do As Directed: [05]

i. A macro is a unit of specification for _____ through expansion. (*Fill in the blank*)
ii. Mention the parameter types of a macro.
iii. Execution gap may be seen between PL domain and Execution domain. (*State True/False*)
iv. Draw AST for the string: a*(b+c)/d.
v. In the operand specification 'A+4(3)', 4 is the first offset to memory location associated with A and 3 is the index of register that contains the second offset. (*State True/False*)

(b) Write the outline of a **Recursive Descent Parser** for arithmetic expressions and show the moves it makes while parsing the following string: id+id*id. [05]

(c) Construct a DFA for the Regular Expression: (a*|b) cd (a|b)# [05]

OR

(c) Construct a DFA for the Regular Expression: a* (b|c)* cde# [05]

Q-2 Answer the following questions: **[10]**

(a) Eliminate Left recursion from given grammars. [05]

a. $S \rightarrow Aa \mid bd \mid b \qquad A \rightarrow Ac \mid Ad \mid \epsilon$
b. $S \rightarrow A \qquad B \rightarrow bBc \mid f \qquad A \rightarrow Ad \mid Ae \mid aB \mid ac$

Also perform left factoring on resultant grammars.

(b) Construct the Operator Precedence Matrix for the following grammar: [05]

$E \rightarrow E+E \mid E*E \mid id$

Also check validity of following string: id*id+id*id

OR

(b) Construct the LL(1) parsing table for given grammar: [05]
$E \rightarrow E+E \mid E*E \mid id$

Also show the derivation of the following string: (id+id)*id

Q-3 Answer the following questions: **[10]**

(a) What are Triples and Quadruples? Write both notations for the expression: a*(b+c)+(b+c)/d. [05]

(b) Explain the difference between Search and Allocation data structures. Describe one technique of each in brief. [05]

OR

(b) Explain the Program Execution models along with their block diagrams. [05]

SECTION - II

Q-4 Answer the following questions: **[15]**

(a) Mention any four Software Tools. Describe any two. [05]

(b) Differentiate: Pure and Impure Interpreter. [05]

(c) What are Advance Assembler Directives? Explain any two. [05]

OR

(c) Explain REPT and IRP statements. [05]

Q-5 Answer the following questions: **[10]**

(a) Write an assembly program to compute factorial of a given number. [05]

a. Show the contents of Symbol Table at the end of Pass I.
b. Show IC Variant I.

(b) What is POOL Table? Why is it required? Mention its role in Assembly of a source program. [05]

OR

(b) Draw the flowcharts: [05]

a. For LC Processing
b. To Manage the TII

Q-6 Answer the following questions: **[10]**

(a) Define a macro taking A and B as parameters to compute [05]

A = A * B + B * C + A

Would you reserve space for the temporary result within or outside the macro body? Why?

(b) Differentiate between: [05]

a. Macro and a Function
b. Macro and an Inline Function

OR

(b) List the data tables used by a macro preprocessor. Explain any one. [05]

---------- ALL THE BEST----------

Enrollment No.												

KADI SARVA VISHWAVIDHYALAYA

B.E. Sem - V (CE) EXAMINATION

Date : 23-04-2015 **Subject : System Software**
Time : 10:30am to 01:30 pm **Subject Code : CE 504**

Instructions: **Max. Marks: 70**

1) **Answer each section in separate answer sheets.**
2) **Assume suitable data where necessary.**
3) **All questions are compulsory; Figures to the right indicate full marks.**
4) **Use of scientific calculator is permitted.**
5) **Indicate clearly, the options you attempt along with its respective Que. No.**

SECTION - I

Q-1 Answer the following questions: **[15]**

(a) Explain Left recursion, Left factoring and backtracking in top down parsing. [05]

(b) List various phases of a language processor. Also explain symbol table. [05]

(c) Construct a DFA for the Regular Expression: (a|b)*abb# [05]

OR

(c) Construct a DFA for the Regular Expression: a*(b|c)*# [05]

Q-2 Answer the following questions: **[10]**

(a) Explain syntax analysis of a compiler. [05]

(b) Construct the Operator Precedence Matrix for the following grammar: [05]

$E \rightarrow E+E \mid E*E \mid id$

Also check validity of following string: id*id+id*id

OR

(a) Explain the Program Execution models along with their block diagrams. [05]

(b) Eliminate Left recursion from given grammars. [05]

a. $S \rightarrow Aa \mid bd \mid b \qquad A \rightarrow Ac \mid Ad \mid \epsilon$

b. $S \rightarrow A \qquad B \rightarrow bBc \mid f \qquad A \rightarrow Ad \mid Ae \mid aB \mid ac$

Also perform left factoring on resultant grammars.

Q-3 Answer the following questions: **[10]**

(a) What are Triples and Quadruples? Write both notations for the expression: a*(b+c)+(b+c)/d. [05]

(b) Consider following grammar [05]

S -> aSbS | bSaS | ε

Derive the string abab. Draw corresponding parse tree. Are these rules ambiguous?

OR

(a) Explain any two Intermediate Code representation. [05]

(b) Which of the following grammars are ambiguous? Justify. [05]

c. $S \rightarrow a \mid Sa \mid bSS \mid SSb \mid SbS$

d. $S \rightarrow a \mid S+S \mid SS \mid S^* \mid (S)$

SECTION - II

Q-4 Answer the following questions: **[15]**

(a) Mention any four Software Tools. Describe any two. [05]

(b) Write short note: Linkers [05]

(c) Differentiate: Pure and Impure Interpreter. [05]

OR

(c) Explain analysis and synthesis phases of an assembler by clearly stating their tasks. [05]

Q-5 Answer the following questions: **[10]**

(a) Explain any two assembler directives. [05]

(b) What is POOL Table? Why is it required? Mention its role in Assembly of a source program. [05]

OR

(a) What are Advance Assembler Directives? Explain any two. [05]

(b) What is the Table of Incomplete Instructions? Explain how it is used. [05]

Q-6 Answer the following questions: **[10]**

(a) Define a macro taking A and B as parameters to compute [05]

$A = A * B + B * C + A$

Would you reserve space for the temporary result within or outside the macro body? Why?

(b) Differentiate between: [05]

a. Macro and a Function

b. Macro and an Inline Function

OR

(a) Explain with examples - expansion time variables, expansion time statements - AIF and AGO for macro programming. Show their usage for expansion time loop by giving example. [05]

(b) List the data tables used by a macro preprocessor. Explain any one. [05]

---------- ALL THE BEST----------