(16)

TE. Comp SEM VI (CBSGS) 10/5/16

S-P.C.C.

Q.P. Code : 581500

May - 16

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **three** from the remaining questions.
(3) Assume suitable **data** if **necessary**.
(4) **Figures** to the **right** indicate **full** marks.

1. (a) What is the role of an automata in compiler design. **5**
   (b) Elliminate Left recursion in the following grammar (Remove Direct and Indirect recursion) **5**
   $S \rightarrow Aa \mid b$
   $A \rightarrow Ac \mid Sd \mid \varepsilon$
   (c) What is an activation record? Draw diagram of General Activation record and explain the purpose of different fields of an activation record. **5**
   (d) What is the difference between Compiler and Interpreter. **5**

2. (a) Explain with an example Quadruples , Triples,Indirect triples. **10**
   (b) What is the difference between Dynamic Loading and Dynamic Linking explain with an example **10**

3. (a) Write a note on JAVA compiler environment. **5**
   (b) Write a brief note on Design of an Editor. **5**
   (c) Explain synthesized and Inherited attributes used in Syntax Directed Definition. **5**
   (d) Find FIRST and FOLLOW Set for given grammar below **5**
   $E \rightarrow T\,E'$ $E' \rightarrow +\,T\,E' \mid \varepsilon$
   $T \rightarrow F\,T'$ $T' \rightarrow *\,F\,T' \mid \varepsilon$
   $F \rightarrow (E)$ $F \rightarrow id$

4. (a) Explain different Code Optimization technics along with an example. **10**
   (b) For the following grammar construct LR(0) parser table **10**
   $S \rightarrow aCDe$
   $C \rightarrow Cbc$
   $C \rightarrow b$
   $D \rightarrow d$
   And Parse the string abbcbcde. Show contents of stack and i/p buffer and action taken after each step.

5. (a) Draw and explain DAG and represent the following example with it. **10**
   (a / b) + (a / b) * (c * d)
   (b) What are the different phases of Compiler ? Illustrate compilers internal representation of source program for following statement after each phase **10**
   Amount = P + P * N * R / 100

6. (a) With reference to Assembler explain following tables with suitable example. **10**
   (i) POT (ii) MOT
   (iii) ST (iv) LT
   (b) What are the different issues in design of Code Generator ? Explain with an example. **10**

T. E. Sem VI C.B.S.G.S. K-T.
(Comp) CBaS 23/11/16
SPACC

Dec - 16

Q.P. Code : 581502

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **three** from the remaining questions.
(3) Assume suitable **data** if **necessary**.
(4) **Figures** to the **right** indicate **full** marks.

1. (a) What is Handle pruning? **5**
   (b) What is role of finite automata in compiler theory? **5**
   (c) What are different type of attributes in SDD? Explain with examples. **5**
   (d) Backpatching with example. **5**

2. (a) Explain two pass macro processor with flowchart and databases. **10**
   (b) Explain various loop optimization techniques with example. **10**

3. (a) a) Construct SLR parsing table for following grammar. Show how parsing actions are done for the input string ( ) () S. Show stacks content , i/p buffer, action. **12**
   S -> (S)S
   S -> ε
   (b) What are various databases used in two pass assembler design. Explain with example. **8**

4. (a) Discuss various intermediate code forms in detail. **10**
   (b) What is Loader ? Explain functions of loader with examples. **10**

5. (a) For the given grammar below, constmct operator precedence relations matrix, assuming*. + are binary operators and id as terminal symbol and E as non terminal symbol. **10**
   E →E + E
   E →E * E
   E →id
   Apply operator precedence parsing algorithm to obtain skeletal syntax tree for the statement
   id + id * id
   (b) Explain Run time organization in detail. **10**

6. Write short notes.
   (a) LEX andY ACC **5**
   (b) Design of an Editor **5**
   (c) Syntax Directed Translation **5**
   (d) Recursive Descent parsing **5**

Q.P.Code:11585

May - 17

(3 Hours) **Total Marks: 80**

N.B.: (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five questions.

Q1. (a) What is system software & application software? (05)
(b) Explain different types of text editor. (05)
(c) Explain left recursion with an example (05)
(d) Write a note on: Input buffering scheme of lexical analyser. (05)

Q2. (a) With reference to assembler, explain the following tables with suitable example. (10)
(i) POT (ii) MOT (iii) ST (iv) LT
(b) Explain the different code optimization techniques in compiler design. (10)

Q3. (a) Draw flowchart and explain with databases the working pass 1 of macro processor. (10)
(b) Explain various functions of loader. Also explain the design and flowchart of Absolute loader. (10)

Q4. (a) Compare LR(0),LR(1) and LALR parser. (10)
Construct LR(0) parser table for following grammer:-
S-> (L) |id
L-> S|L,S
Variables: S and L
Terminals: (id ,)

(b) Explain different ways to represent three address code. (10)

Q5. (a) Explain run time storage organization in detail. (10)
(b) Explain the different phases of compiler. Illustrate the output after each phase for the following statement: (10)
a = b + c-d*5

Q6. (a) Differentiate Top-down and Bottom-up parsing techniques. Explain recursive descent parser with an example. (10)

(b) Write short note on: (10)
(i) Basic block and flow graph
(ii) JAVA compiler environment.

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T. E / Sem VI / Comp / SPCC / 21 / 11 / 17

Q.P.Code:11586

Dec - 17

(3 Hours) **Total Marks: 80**

N.B.: (1) Question No. 1 is compulsory.
(2) Attempt any THREE questions out of remaining five questions.
(3) In all 4 questions to be attempted.
(4) Assume Suitable data if necessary.
(5) Figures in brackets on the right hand side indicate full marks.

Q1. (a) Define System Programming? State difference between Application Programs and System programs? (05)
(b) Explain different types of text editors in brief. (05)
(c) Explain the java compiler environment. (05)
(d) State difference between LL parser and LR parser. (05)

Q2. (a) Explain the design of two pass assembler with flowchart and databases. (Clearly show entries in databases.) (10)

(b)What do you mean by operator precedence grammar? With the help of following given grammar, parse the input string " a+b*c*d". (10)

E → E+T|T
T→ T*V|V
V→ a|b|c|d

Q3. (a) Explain the working of two pass macro processor with neat flowcharts and databases. (Clearly show entries in databases.) (10)

(b) Explain different types of code optimization techniques in compiler design. (10)

Q4. (a) Construct LL(1) parsing table for the following grammar:- (10)

S → aBDh
B → cC
C → bC | ε
D → EF
E → g | ε
F → f | ε

Check whether the string **" acbgh"** is valid or not.

(b) Discuss different issues in design of code generator. (10)

Q5. (a) Explain different types of Intermediate Code representation with examples? (10)
(b) Explain working of direct linking loader with example, showing entries in different databases built by DLL. (10)

Q6. (a) Explain the different phases of compiler with suitable example? (10)
(b) Write short note on: (Any Two) (10)
(i) Syntax Directed Definition
(ii) LEX & YACC
(iii) garbage collection and compaction

MAY 2018 / 14.05.2018

Q.P.Code:11587

May - 18

(3 Hours) Total Marks: 80

N.B.: (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five questions.

Q1. (a) Differentiate between system software & application software? [05]
(b) Explain the role of finite automata in compiler theory. [05]
(c) Explain the various functions of a loader. [05]
(d) Compare compilers and interpreters. [05]

Q2. (a) With reference to assembler, explain the following tables with suitable example.
(i) POT (ii) MOT (iii) ST (iv) LT [10]
(b) Explain the different code optimization techniques in compiler design. [10]

Q3. (a) Explain the different issues in code genetrations. [10]
(b) Explain working of direct linking loader with example, showing entries in different databases built by DLL. [10]

Q4. (a) Construct a predictive parsing table for the grammar : - [10]

$E \rightarrow TE'$
$E' \rightarrow +TE' / E$
$T \rightarrow FT'$
$T' \rightarrow *FT' / \epsilon$
$F \rightarrow (E) / id$

(b) Explain the different error recovery techniques [10]

Q5. (a) Explain the different storage allocation strategies in detail. [10]
(b) Differentiate Top-down and Bottom-up parsing techniques. Explain shift reduce parser in detail. [10]

Q6. (a) Explain the different phases of compiler. Illustrate all these phases for the following statement:
a = b + c * 5 [10]
(b) Write short note on: [10]
(i) Parameterized Macros
(ii) YACC

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Dec - 18

(3 Hours) **Total Marks: 80**

N.B.: (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five questions.

Q1. (a) What is system software & application software? (05)
(b) Explain different features of macros. (05)
(c) Compare Compiler and Interpreter. (05)
(d) Write a note on: Java Compiler environment. (05)

Q2. (a) With reference to macroprocessor, explain the following tables with suitable example. (10)
(i) MNT (ii) MDT (iii) ALA
(b) Explain the different code optimization techniques in compiler design. (10)

Q3. (a) Draw flowchart and explain with databases the working pass 2 of assembler. (10)
(b) Explain various functions of loader. Compare linking loader and linkage editor. (10)

Q4. (a) Consider the following grammar (10)
S-> (A)|0
A-> SB
B->,SB|ε
Is the above grammar LL (1)? Justify your answer.
(b) Explain different types of Intermediate code representations. (10)

Q5. (a) Explain the different types of garbage collection and compaction in compilers. (10)
(b) Differentiate Top-down and Bottom-up parsing techniques. Explain recursive descent parser with an example. (10)

Q6. (a) Explain the different phases of compiler. Illustrate all the output after each phase for the following statement:
a = b + c-d*5
(b) Write short note on: (10)
(i) Synthesized and Inherited attrinutes.
(ii) Debug monitor.

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May - 19

(3 Hours) **Total Marks: 80**

N.B.: (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five questions.

Q1. (a) Define loader. Explain functions of loader. (05)
(b) What are different features of macro? (05)
(c) Compare compilers and interpreters. (05)
(d) Explain synthesized and inherited attributes. (05)

Q2. (a) With reference to assembler, explain the following tables with suitable example.
(i) POT (ii) MOT (iii) ST (iv) LT (v) BT (10)
(b) Design a predictive parser for the given grammar. Mention all the steps (10)

E-> TQ
T-> FR
Q-> +TQ|-TQ|E
R-> *FR|/FR|E
F-> (E)|id

Q3. (a) Explain pass 1 of macro processor with flowchart. (10)
(b) What is code optimization? What are various strategies for code optimization? (10)

Q4. (a) Explain the design of the absolute loader and mention all the data structures in detail. (10)
(b) What are different types of intermediate code? Explain implementation of three address code. (10)

Q5. (a) Write a note on Input buffering and also explain role of lexical analyser. (10)
(b) Explain various storage allocation strategies. (10)

Q6. Write a note on:
(a) DAG (05)
(b) Lex and YACC (05)
(c) Syntax directed translation (05)
(d) Text editors (05)

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Dec - 19

Time: 03 Hours **Marks: 80**

Note: 1. Question 1 is compulsory
2. Answer any three out of remaining five questions.
3. Assume any suitable data wherever required and justify the same.

Q1 a) Why is data integration required in a data warehouse, more so than in an operational application? [5]

b) Describe the steps involved in Data Mining when viewed as a process of knowledge Discovery. [5]

c) A dimension table is wide, the fact table is deep. Explain [5]

d) Elucidate Market Basket Analysis with an example. [5]

Q2 a) Suppose that a data warehouse consists of the three dimensions time, doctor and patient, and the two measures count and charge, where charge is the fee that a doctor charges a patient for a visit. [10]

(i) Draw a star schema diagram for the above data warehouse.

(ii) Starting with the base cuboid [day, doctor, patient], what specific OLAP operations should be performed in order to list the total fee collected by each doctor in 2010?

(iii)To obtain the same list, write an SQL query assuming the data are stored in a relational database with the schema fee (day, month, year, doctor, hospital, patient, count, charge).

b) Develop a model to predict the salary of college graduates with 10 years of work experience using linear regression. [10]

Years of experience (x)	Salary in $100 (y)
3	30
8	57
9	64
13	72
3	36
6	43
11	59
21	90
1	20
16	83

Q3 a) Suppose that the data for analysis includes the attribute salary. We have the following values for salary (in thousands of dollars), shown in increasing order: 30, 36, 47, 50, 52, 52, 56, 60, 63, 70, 70, 110. [10]

(i) What are the *mean, median, mode* and *midrange* of the data?

(ii) Find the *first quartile* (Q1) and the *third quartile* (Q3) of the data.

(iii)Show a *boxplot* of the data.

b) Why is entity-relationship modeling technique not suitable for the data warehouse? How is dimensional modeling different? [10]

Q4 a) Why is tree pruning useful in decision tree induction? What is a drawback of using a separate set of tuples to evaluate pruning? [10]

b) Consider the transaction database given below, [10]

TID	Items
10	1, 3, 4
20	2, 3, 5
30	1, 2, 3, 5
40	2, 5
50	1, 3, 5

Use Apriori Algorithm with min-support count = 2 and min-confidence = 60% to find all frequent itemsets and strong association rules.

Q5 a) Show the dendrogram created by the complete link clustering algorithm for the given set of points. [10]

	A	B
P1	2	4
P2	8	2
P3	9	3
P4	1	5
P5	8.5	1

b) What is spatial data? Explain CLARANS Extension. [10]

Q6 a) Demonstrate Multidimensional and Multilevel Association Rule Mining with suitable examples. [10]

b) What is Web Structure Mining? List the, approaches used to structure the web pages to improve on the effectiveness of search engines and crawlers. Explain Page Rank technique in detail. [10]

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