

ME / COMPN / II (CAS) 31/5/13  
Advanced Compiler Design

D : PH (April Exam) 297

Con. 9573-13.

BB-9127

(3 Hours)

[ Total Marks : 80

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

1. Solve any **four** from the followings :-

- (a) Comment whether the following grammar is LL(1) or not 5  
 $S \rightarrow aAbB \mid bAaB \mid \epsilon$  (epsilon)  
 $A \rightarrow S$   
 $B \rightarrow S$
- (b) Using triples and Indirect triples, represent the following statement- 5  
 $a = b * - c + b * - c$
- (c) Explain scalar replacement with Aggregates along with example. 5
- (d) Explain Loop simplifications with example. 5
- (e) Use of DAG with reference to code generation. 5

2. (a) Show that the following grammar- 10

$S \rightarrow Aa \mid bAc \mid Bc \mid bBa$   
 $A \rightarrow d$   
 $B \rightarrow d$

is LR(1) but not LALR (1).

(b) Explain Global value numbering with example. 10

3. (a) Apply common subexpression elimination, Reassociation, Loop-invariant code motion on following code. 10

```
do i = m, n
  a = b + i
  c = a - i
  d = b + i
end do
```

- (b) (i) Suggest datastructure required for implementation of LR parsers. 10  
(ii) Show that No **LL(1)** grammar can be ambiguous.

[TURN OVER

4. (a) Apply tree transformations to simplify following addressing expression  $a[i][j]$  10  
denoted by

$$\text{base}_a + (i - 101) * ( \text{hiz} - 102 + 1) + j - 102) * w$$

(Hint – apply Algebraic Simplification and Reassociation technic)

- (b) Consider Basic Block given below – 10

$$t_6 = a + b$$

$$t_5 = t_6 - c$$

$$t_8 = d + e$$

$$t_4 = t_5 * t_8$$

$$t_2 = t_6 + t_4$$

$$t_3 = t_4 - e$$

$$t_1 = t_2 * t_3$$

(i) Construct DAG

(ii) Suggest optimal order of evaluation for it

(iii) Apply simple code generation algorithm to generate code.

5. (a) How run time storage management is done during code generation. 10

(b) (i) Explain Branch prediction with example. 5

(ii) Explain tail merging with example. 5

6. (a) Explain Global register allocation algorithm and how graph coloring is applicable to it. 10

(b) Write short notes on – 10

(i) Induction variable elimination

(ii) Code hoisting.

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9/5/2013

M.E (CMPN) 2<sup>nd</sup> I (A)

Advance Operating

Systems. BB-9082

VT-F.H.Exam. April(1)-13-139

Con. 8076-13.

( 3 Hours )

[ Total Marks : 80

[ N.B. : Attempt any four questions. ]

1. (a) What are the design approaches in operating system ? Why different 10 approaches are used for designing O.S. ? Discuss the advantages and disadvantages of each approach.  
(b) Explain the Raymond's tree based algorithm with the help of example. 10
2. (a) What is distributed deadlock detection ? What are the different classes of 10 distributed deadlock detection ? Explain any two distributed deadlock detection algorithm.  
(b) What do you understand by the term real time ? How is the concept of real 10 time different from traditional notion time ? Explain your answer with the help of example.
3. (a) Discuss the issues in processor scheduling. Explain smart scheduling and 10 affinity based scheduling in multiprocessor O.S.  
(b) Two phase locking increases concurrency in transaction execution relative 10 to static locking. However what problems are associated with two-phase locking ? Explain in detail.
4. (a) Explain the migration algorithm and full replication algorithm for implementing 10 distributed shared memory.  
(b) What do you understand by the term "priority inversion" in the context of 10 real time task scheduling ? When several task share a set of critical resources, is it possible to avoid priority inversion altogether by using suitable task scheduling algorithm ? Explain.
5. (a) Explain user level threads and Kernel level threads. 10  
(b) Explain the Kernel design in symbian operating system. 10
6. Write short notes on following :- (any four) 20
  - (a) Requirement of database operating system
  - (b) Android operating system
  - (c) Cloud operating system
  - (d) Applications of RTOS
  - (e) Fault tolerance in multiprocessor O.S.

M.E (Comp) SEM II (EAS) 14/5/13  
Cyber Security May 2013

D : PH (April Exam) 211

Con. 8431-13.

BB-9094

(3 Hours)

| Total Marks : 80

**N.B.** (1) Question No. 1 is compulsory.

(2) Attempt any **three** questions out of **five** questions remaining.

(3) Make **suitable** assumption if **necessary** and state it **clearly**.

1. (a) Who are Cyber criminals ? 5
- (b) What are the key provisions in Indian IT Act, 2000 (ITA -2000) ? 5
- (c) What is Cyber stalking ? Explain it. 5
- (d) Distinguish between proxy and anonymizer. 5
2. (a) Describe the various types of Cyber crimes with their classifications in detail. 10
- (b) What are types of ID theft attacks ? How to protect being victim of ID theft ? 10
3. (a) What is Indian perspective of Cyber laws ? Are they adequate to protect from Internet Cyber crimes ? 10
- (b) Describe the various vulnerabilities in enterprise network. 10
4. (a) Explain the counter measures to be practiced for possible attacks on mobile/cell phones. 10
- (b) Discuss what is required in setting up a computer forensics laboratory. What tools are required on hardware and software side ? 10
5. (a) What are the various phases and activities involved in Life-cycle of a forensics investigation process ? 10
- (b) Describe any three key practices in organization's end point security program. 10
6. Write short notes on following :- 20
  - (a) Cyber crime and cloud computing.
  - (b) Global cooperation in fighting against Cyber crimes.
  - (c) Organization best practices for Cyber security.
  - (d) SQL injection.

- N.B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **three** questions out of remaining **five** questions.  
 (3) Assume **suitable** data whenever **required**.

1. (a) Explain steps in the Decision Making process. 5  
 (b) Compare MCDM and MADM method. 5  
 (c) State the different applications where optimization can be used. 5  
 (d) List the steps in Genetic Algorithm. 5
2. (a) Design and explain the structure of Adaptive Business Intelligence. 10  
 (b) Describe various characteristics of complex business problem with suitable example. 10
3. (a) What are factor must be taken in to account while selecting the best prediction method ? 10  
 (b) What is an Expert system ? How neural network can be used to design decision making model for car distribution problem ? 10
4. The "ABC" Company want to purchase a software for their operations. Assume four alternative software and seven criteria. The criteria considered are cost (CO), Supplier Support (SS), Ease of Implementation (EI), Closeness of fit to the company business (FB), Flexibility to easily change as the company business changes (FC), Technological risk (TR) and System Integration (SI). The weights of these criteria are 0.242, 0.360, 0.042, 0.102, 0.030, 0.157 and 0.067 respectively. The normalized values are calculated for all seven beneficial criteria are as :-

Software	CO	SS	EI	FB	FC	TR	SI
A1	0.55	0.70	0.39	0.64	0.61	0.30	0.55
A2	0.46	0.35	0.55	0.40	0.41	0.69	0.39
A3	0.28	0.35	0.63	0.32	0.30	0.59	0.39
A4	0.64	0.52	0.39	0.56	0.61	0.30	0.63

Apply SAW, WPM and AHP method to calculate the tank of software and find the final software selection.

5. (a) Explain Simulated annealing Alogrithm with suitable example. 10  
 (b) Explain in brief Ant colony optimization. 10
6. Write a short notes on (any two) :- 20
  - (a) Tabu search
  - (b) Hybrid system for Stock Market Predection
  - (c) Adaptive Business Inlelligence approach for credit card fraud delection system.

**N.B. :** (1) Question No. 1 is **compulsory**.

(2) Attempt any **three** questions out of remaining **five** questions.

(3) Assume **suitable** data if **required**.

(4) **Figures** to the **right** indicate **full** marks.

1. (a) Define support, core, normality, crossover points and  $\alpha$ -cuts for fuzzy set. 5
- (b) Explain McCulloch pitts neuron model with the help of example. 5
- (c) What is Genetic Algorithm ? What are the operators envolved in simple genetic algorithm ? Explain any one with example. 5
- (d) What is associative memory ? Explain its types ? 5

2. (a) A single neuron network using  $f(\text{net}) = \text{sgn}(\text{net})$  has been trained using the 10 pairs  $(x_i, d_i)$  as given below :-

$$X_1 = [ 1 \quad -2 \quad 3 \quad -1 ]^t, \quad d_1 = -1$$

$$X_2 = [ 0 \quad -1 \quad 2 \quad -1 ]^t, \quad d_2 = 1$$

$$X_3 = [ -2 \quad 0 \quad -3 \quad -1 ]^t, \quad d_3 = -1.$$

The final weights obtained using the perceptron rule are -

$$W_4 = [ 3 \quad 2 \quad 6 \quad 1 ]^t$$

Knowing that correction has been performed in each step for  $C = 1$ , determine following weights :-

(i)  $W_3, W_2, W_1$  by backtracking rhe learning ?

(ii)  $W_5, W_6, W_7$  obtained for steps 4, 5, 6 of Training by reusing the sequence  $(X_1, d_1), (X_2, d_2), (X_3, d_3)$

- (b) Explain architecture and training atgorithm for ART, network. 10
3. (a) Explain artchitecture of BAM. How is storage and retrival is performed in BAM. 10
  - (b) Explain different possible integrations of ANN and fuzzy systems. 10

Con. 10161-BB-1764-13.

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4. (a) Let  $A = \{ a_1, a_2 \}$ ;  $B = \{ b_1, b_2, b_3 \}$   $C = \{ c_1, c_2 \}$  Let R be a relation 10  
from A to B defined by matrix :-

$$\begin{array}{ccc} & b_1 & b_2 & b_3 \\ a_1 & [0.4 & 0.5 & 0 \\ a_2 & [0.2 & 0.8 & 0.2 \end{array}$$

Let s be a relation from B to C defined by matrix :-

$$\begin{array}{cc} & C_1 & C_2 \\ b_1 & [0.2 & 0.7 \\ b_2 & [0.3 & 0.8 \\ b_3 & [1 & 0 \end{array}$$

- (i) Find max-min composition of R and S.
  - (ii) Find max-product composition of R and S.
- (b) Explain Error back propagation training algorithm with the help of flowchart. 10
5. Using Mamdani fuzzy model, Design a fuzzy logic controller to determine the 20  
wash time of domestic washing machine. Assume that the inputs are dirt and  
grease on cloths. Use three descriptors for each input variables and fire descriptors  
for output variables. Derive set of rules for control action and defuzzification.
6. Write short notes :- 20
- (a) Competative learning
  - (b) GA-fuzzy system approach
  - (c) Linear and non-linear activation functions in ANN
  - (d) Delta Learning Rule.