MID SEMESTER EXAMINATION, September-2017

IT-403: Compiler and Translator Design

Time: 1:30 Hrs

Max. Marks: 20

Note: All questions are compulsory. Assume suitable missing data, if any.

1. Define with an example: Grammar, DFA, Regular Expression, Regular Definitions, Lexemes Token and Pattern. [3]

2. What is a primary function of a compiler? What are its secondary functions? [2]

3. (a) Consider the below grammar:

   $S \rightarrow AS \mid b$
   $A \rightarrow SA \mid a$

   Show that this grammar is ambiguous. Also, show that this grammar is left recursive or not. If yes, remove its left recursion. [3]

4. Construct NFA for the following regular expression using Thompson's construction.

   (a)*(a|b)b

   Construct the corresponding DFA from the above NFA [4]

5. Consider the following program:

   ```
   int main ()
       {
           int i;
           for(i=0; i<5; i++)
           {
               printf("Hello World\n)";
           }
       }
   ```

   List down the lexemes, tokens and the attributes of the tokens, at the end of the lexical analysis of the above program. [4]

6. Consider the following grammar for if-then-else statements:

   $S \rightarrow$ if expr then SS' | assignment
   $S \rightarrow$ else S | $\in$, where S and S' are non-terminals, and if, expr, then, assignment and else are terminals. Generate the non-recursive predictive parsing table for this grammar and show whether it is LL(1) or not. [4]

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Total No. of Pages: 1

Roll No.:

BE(IT)

SEVENTH SEMESTER

MID SEMESTER EXAMINATION, September 2017

IT-402: DISTRIBUTED SYSTEMS & COMPUTING

Time: 1½ hrs.

Max. Marks: 20

Note: *Attempt all questions.*

1. What is the number of copy operations needed on applying the following buffering strategies: [5]
   a. Null buffer
   b. Single-message buffer
   c. Multiple-message buffer

   What are the different semantics used for synchronization? Which of these is/are used for synchronous communication? Justify.

2. How is a packet sent by a sender to multiple receivers, if the network supports: [5]
   a. Multicasting
   b. Only broadcasting
   c. Neither multicasting nor broadcasting

   Also mention the number of packets sent over the network in each of the above cases.

3. Differentiate between the following: [4]
   (a) At-least-once semantics and exactly-once semantics
   (b) Flexibility and scalability in distributed systems

4. Discuss the methods that can be used for achieving location transparency in process addressing for message-passing system. [3]

5. Describe the technique used for implementing consistent-ordering semantics that overcomes the problem of single-point of failure. [3]

Roll No.................

Date................

B.E. (Information Technology-VIIth Semester)
Mid Semester Examination – September 2017
IT-401 (Internet and Web Engineering)

Time: 1:30 Hrs

Max. Marks-20

Note: Attempt All Questions
  Assume suitable missing data, if any.

(1x5=5)

SECTION –I

1. Differentiate between Asymmetric and Symmetric key.
2. Discuss briefly Star and Ring Topology.
3. Mention the port number for FTP and DNS
4. Differentiate between the Static and Dynamic HTML.
5. Discuss Authentication and Authorization.

(2x5=10)

SECTION –II

1. Draw neat and clean TCP/IP model and explain each layer with their protocols.
2. Calculate the network Id, Subnet Mask, Block Size and First valid host IP address of given IP address 10.20.30.40/25.
3. Short note on the following network devices: - Hub, Switch, Router and Gateways.
4. Illustrate the connection less and connection oriented services with tabular view of respective protocols.
5. Explain HTML Forms with their suitable properties and examples.

(1x5=5)

SECTION –III

1. a) Explain different HTML forms implementation with examples.

   b) Write a program of HTML webpage to open the link in first frame in another frame

OR

2. a) Describe various network flow control strategies in detail.

   b) Discuss the following routing protocols in detail.

   i) RIP
   ii) EIGRP
   iii) OSPF

BE (Information Technology) VII SEMESTER
B.E MID SEMESTER EXAMINATION, SEPTEMBER- 2017
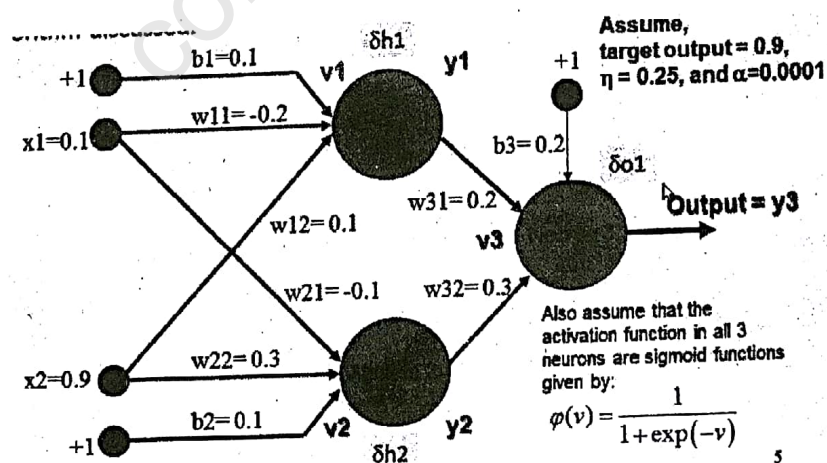IT-708: SOFT COMPUTING AND NEURAL NETWORKS

Max.Marks:20

Time: 1.30 Hours

Note: Attempt all questions. Assume suitable missing data, if any.

Q.1) Explain the working of ANN Architectures (any two), different Activation Functions (Linear and Nonlinear) and Hebb rule.   (4 Marks)

Q.2) Explain how an Adaline works, i.e., describe the function that it computes and its learning algorithm.   (3 Marks)

Q.3) Consider the simple example of classifying aeroplanes. Here, appropriate training data inputs might be a set of measured masses and top speeds of known aeroplanes: construct a neural network that can classify any Bomber or Fighter.   (3.5Marks)

Mass	Speed	Class
1.0	0.1	Bomber
2.0	0.2	Bomber
0.1	0.3	Fighter
2.0	0.3	Bomber
0.2	0.4	Fighter
3.0	0.4	Bomber
0.1	0.5	Fighter
1.5	0.5	Bomber
0.5	0.6	Fighter
1.6	0.7	Fighter

Q.4) Give an Algorithm for Perceptron Learning and explain with an example.   (4 Marks)

Q.5) Give all the expressions for one complete Forward and Backward Pass according to the backpropagation training Algorithm   (4 Marks)

Assume,
target output = 0.9,
$\eta = 0.25$, and $\alpha = 0.0001$

b1=0.1, +1, w11=-0.2, x1=0.1, w12=0.1, w21=-0.1, w22=0.3, b2=0.1, x2=0.9, +1, v1, v2, $\delta h1$, $\delta h2$, y1, y2, w31=0.2, w32=0.3, v3, b3=0.2, $\delta o1$, Output = y3

Also assume that the activation function in all 3 neurons are sigmoid functions given by:
$$\varphi(v) = \frac{1}{1+\exp(-v)}$$

P.T.O

BE (Information Technology) VII SEMESTER
B.E MID SEMESTER EXAMINATION, SEPTEMBER- 2017
IT-405: ADVANCES IN DIGITAL SYSTEM DESIGN

Max.Marks:20

Time: 1.30 Hours

Note: Attempt all questions. Assume suitable missing data, if any.

Q.1) Explain ROM, PROM, PAL and PLA with example of each along with Boolean expressions and Gate
Structure also state the applications. (4 Marks)

Q.2) The No-Homers Club of Springfield is directed by a committee consisting of 4 members (P,A,B,C).
Some issues require absolute majority, i.e., the vote of at least 3 members. Other issues are more
relaxed and can be decided by the vote of the president (P) in case of divided opinion, i.e., if there are 2
favorable votes and one of them is the president, then the decision gets approved.
a. Write a truth table of the two decision rules (called D1 and D2), assume an input takes the value "1"
when the correspondent member votes affirmatively, and the output takes the value "1" when the
decision is approved. (3.5Marks)
b. Write a minimum expression for the outputs, using K-maps.

Q.3) Design an excess 3 to BCD code converter, requiring that all invalid input combinations give 0000 as
the output code. Write a expression for the outputs, using K-maps. How many AND gates, OR gates, and
inverters implementation requires. (3.5Marks)

OR

Q.3) Design two versions of the combinational circuit whose input is a 4-bit number and whose output is
the 2's complement of the input number such that:
(i) The circuit is made up of four identical two-input, two output cells, one for each bit. The cells are
connected in cascade, with lines similar to a carry between them. The value applied to the rightmost
carry bit is 0.
(ii) The circuit is redesigned with carry look ahead-like logic in order to speed up the circuit in part (ii) for
use in larger circuits with 4n input bits also Give expression using K-maps for logic used to redesign with
carry look ahead-like logic. (3.5Marks)

Q.4) Explain the different component of Algorithmic state machine chart. The following state diagram
contains both Mealy and Moore outputs. The Mealy output Y 1 and Y 2 is depending on the present
state and input state X. Output Ya , Yb , and Yc are Moore outputs. Draw the ASM Chart, Truth Table and
give the design using D flip-flop. (4 Marks)
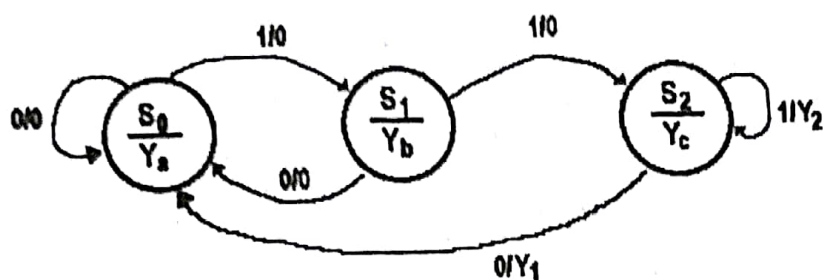
Q.5) Solve any Two

a) Explain the Multiprocessor And Multicomputers.   (2.5 Marks)

b) Explain Flynn's classification of Computer Architecture.   (2.5 Marks)

c) Provide a list of the main advantages and disadvantages of shared-memory and Distributed memory Paradigm.   (2.5 Marks)

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