Manipal Institute of Technology
Department of Computer Science and Engineering
Second M.Tech. [CSE]
Assignment -3 [Improvement]
Advanced System software-CSE 5251

Time: 30 Minutes **Marks: 05 M**

Note:
-Answer the following questions

-The time given for answering the questions is 30 Minutes, and the additional 60 Minutes is provided for hassle-free submission[Photocopy]

-Students must write the answers in their own handwriting on a white sheet of paper.

-The details to be mandatorily written on the answer sheet are: Name, Semester, Section, Roll Number, Registration Number, Course name, Signature with date.

-On completion of answering the assignment, students need to scan/image (using device of your choice) all the answer sheet/s in sequence and save it with file name of their registration number in PDF/ Image format.

-Upload the above pdf/image file containing the answers to MS Teams Assignment platform within the given schedule.

-CLICK ON "ADD WORK" OPTION, ATTACH THE PDF/IMAGE AND THEN CLICK ON "TURN IN".

-Student to contact faculty member concerned through mail/phone in case of any difficulty faced by them during the assessment process.

Q-a) Differentiate between synthesized attribute and inherited attribute with the examples. Construct the DAG for the expression a+a+(a+a+a+(a+a+a+a)) and also write steps for constructing the DAG. 2M

b) Translate the expression a[i] = b*c – b*c into Quadruples, Triples, and Indirect Triples. Generate code for the statements x = b*c, y=a+x , assuming all variables are stored in memory locations. 2M

c) Explain what is meant by (distribution) transparency, and give examples of different types of transparency. 1M

Answer Scheme

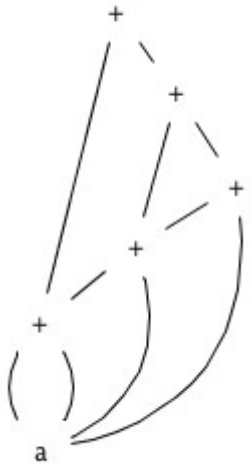
a)Differentiate between synthesized attribute and inherited attribute with the examples.

Sythesized attribute	Inherited attribute
An attribute is said to be Synthesized attribute if its parse tree node value is determined by the attribute value at child nodes.	An attribute is said to be Inherited attribute if its parse tree node value is determined by the attribute value at parent and/or siblings node.
The production must have non-terminal as its head.	The production must have non-terminal as a symbol in its body.
A synthesized attribute at node n is defined only in terms of attribute values at the children of n itself.	A Inherited attribute at node n is defined only in terms of attribute values of n's parent, n itself, and n's siblings.
It can be evaluated during a single bottom-up traversal of parse tree.	It can be evaluated during a single top-down and sideways traversal of parse tree.
EX:- E.val -> F.val	EX:- E.val = F.val

1M

Construct the DAG for the expression a+a+(a+a+a+(a+a+a+a)) and also write steps for constructing the DAG.

1 id a
2 + 1 1
3 + 2 1
4 + 3 1
5 + 3 4
6 + 2 5



p1=leaf(id,entry-a)
p2=leaf(id,entry-a)=p1
p3=Node('+',p1,p2)
p4=Node('+',p1,p3)
p5=Node('+',p1,p4)
p6=Node('+',p4,p5)
p7=Node('+'p3,p6) **(0.5+0.5)=1M**

b) Translate the expression a[i] = b*c – b*c into Quadruples, Triples, and Indirect Triples.

Quadruples (op, arg1, arg2, result) 0.5M

```
0) *   b   c   t1
1) -   t1  t1  t2
2) []= a   i   t3
3) =   t2      t4
```

Triples(op, arg1, arg2) 0.5M

```
0) *    b    c
1) *    b    c
2) -   (0)  (1)
3) []= a    i
4) =   (3)  (2)
```

Indirect Triples 0.5M

```
0)
1)
2)
3)
4)
```

Generate code for the statements x = b*c, y=a+x , assuming all variables are stored in memory locations. 0.5M

```
LD R1, b
LD R2, c
MUL R1, R1, R2
LD R3, a
ADD R3, R3, R1
ST y, R3
```

c) Explain what is meant by (distribution) transparency, and give examples of different types of transparency.

Distribution transparency is the phenomenon by which distribution aspects in a system are hidden from users and applications. Examples include access transparency, location transparency, migration transparency, relocation transparency, replication transparency, concurrency transparency, failure transparency, and persistence transparency. *1M*