Tribhuvan University
Institute of Science and Technology
2081
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Bachelor Level / Third Year /Six Semester/Science
Computer Science and Information Technology (CSC 365)
(Compiler Design and Construction)
(NEW COURSE)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Section A

Attempt any TWO questions. **[2×10=20]**

1. Give an example of reduce - reduce conflict. Construct the SLR parsing table for the following grammar. [2 + 8]
   E → (L) | a
   L → L , E | E

2. What are the significances of intermediate code? Differentiate between DAG and Syntax tree. Represent the instruction A = B + C – D * E + G using quadruple and triple. [1 + 3 + 6]

3. Illustrate the concept of back patching with an example. Convert the regular expression a(a + b)a# to DFA. [3 + 7]

Section B

Attempt any EIGHT questions. **[8 × 5 = 40]**

4. Explain different phases of compiler in brief. [5]

5. What types of information are stored by symbol table? Discuss about activation record. [2 + 3]

6. Compute the FIRST and FOLLOW of the non-terminals in the following grammar. [5]
   S → (L) | 1
   L → LS | *S

7. Write the code generation algorithm for the instruction *a = b op c*. [5]

8. Define core item. Compute the LR(1) item sets for the following grammar. [1 + 4]
   S → AA
   A → aA | b

9. How do you represent recursion in activation tree? Generate the three address code for following instruction. [1 + 4]

```
n = (a + b) * (c – d)
for(i=0; i<n; i++)
{
        for(j=0; j<n; j++)
        {
                x = n + i + j;
        }
}
```

10. What are the techniques for compiler optimization? Explain. [5]

11. Describe the synthesized attribute and inherited attribute with example. [5]

12. What is type expression? List the properties of LL(1) grammar. [2.5 + 2.5]