Total No. of Questions : 8] **SEAT No. :**

P3991 **[Total No. of Pages : 3**

[4959]-1152
B.E. (Computer Engineering)
PRINCIPLES OF MODERN COMPILER DESIGN
(2012 Course) (Semester - I) (410442)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 and Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Assume suitable data if necessary.***

Q1) a) Explain in detail the front end-Back end arrangement of compiler design. **[6]**

b) Check whether following grammer is LL (1). Also depict the moves by parser for input string "ab". **[6]**

S->aABb

A->c | ε

B->d | ε

c) Explain following terms with suitable examples:

i) S- Attributed Grammar

ii) L- Attributed Grammar

iii) Type Expression

iv) Back Patching **[8]**

OR

Q2) a) Explain the Role of Lexical Analyzer. Explain Interaction between Lexical Analyzer and parser. Define Lexeme, Token and Pattern with suitable example. **[6]**

P.T.O.

b) Construct Predictive Parser for following grammar. **[6]**

$S \rightarrow a\ B\ D\ h$

$B \rightarrow B\ b \mid c$

$D \rightarrow E\ F$

$E \rightarrow g \mid \varepsilon$

$F \rightarrow f \mid \varepsilon$

c) What is mean by 'Syntax Directed Definitions'? Give syntax directed translation scheme for "if E then S". **[8]**

Q3) a) What are different issues in code generation? **[6]**

b) What is DAG? Explain its use in code generation. Generate DAG for following: **[6]**

T1 = b + c

T2 = d * e

T3 = d + c

T4 = T2 * T3

T5 = T4 * f

X = T1 - T5

c) Explain in brief following techniques: **[6]**

i) Constant folding

ii) Loop unrolling

iii) Strength reduction

OR

Q4) a) What is need for next-use information? Explain how to compute next-use information. **[6]**

b) Generate quadruples for the following: if(a>b) then x=p*q. **[4]**

c) What is Register Allocation and Assignment Problem? **[4]**

d) Write short note: Peephole Optimization. **[4]**

Q5) a) Write a note on importance of source language data representation. **[6]**

b) Explain the row major and column major representation of arrays. **[6]**

c) Explain type checking with respect to context handling. **[4]**

OR

Q6) a) Explain structure of a functional compiler. Discuss various issues related to compilation of functional languages . **[6]**

b) Write short note on Jave CC. **[6]**

c) What is meant by desugaring? Why is this required? **[4]**

Q7) a) Write short note on NVidia CUDA compiler. **[6]**

b) What is interpreter? Explain JVM as an example of interpreter. **[4]**

c) How tuple space can be implemented on distributed memory systems. **[6]**

OR

Q8) a) Explain following points for parallel Object Oriented languages: Object location, object migration, object replication. **[6]**

b) How cross compilation is achieved using XMLVM tool? **[6]**

c) Write short note on nmake & cmake. **[4]**