

Total No. of Questions : 6]

SEAT No. :

P105

[Total No. of Pages : 2

**Oct.-16/B.E./Insem.- 163**

**B.E. (Information Technology) (Semester - I)**

**MODERN COMPILERS (Elective - I (c))**

**(2012 Pattern)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates:*

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Assume suitable data, if necessary.*

**Q1)** a) Write the translation of following statement into IR tree:

if  $x < 5$  then  $a > b$  else 0.

**[4]**

b) Describe each phase of compiler in brief.

**[6]**

OR

**Q2)** a) For each variable a,b,c,d in the given C program, say whether the variable should be kept in memory or a register and why? **[4]**

```
int f(int a, int b)
{
    int c[3], d;
    d=a+1;
    b=g(c,&b);
    return c[1]+b;
}
```

b) Define stack frame? Explain the concepts of Stack Pointer (SP) and Frame Pointer (FP) with respect to stack frame. **[6]**

**Q3)** a) Define canonical trees. Describe any one identity for transformation on ESEQ. **[4]**

b) Write an algorithm for optimal tiling instruction selection and comment on its efficiency. **[6]**

OR

**P.T.O.**

**Q4)** a) Define flow-graph terminologies with the help of suitable flow-graph. **[4]**

i) Predecessor

ii) Successor

iii) Uses

iv) Defs

b) What is the architecture of Pentium computers? Write any two problems and corresponding solution of this architecture with respect to instruction selection? **[6]**

**Q5)** a) What is coalescing? Explain any one strategy for the same. **[6]**

b) Explain the concepts of precolored nodes with suitable example. **[4]**

OR

**Q6)** a) What is incremental garbage collection? Describe tricolor marking. **[4]**

b) Explain the algorithm of Mark-and-Sweep garbage collection. **[6]**

