

Hall Ticket Number:

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Code No. : 17645 S N/O

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD**  
*Accredited by NAAC with A++ Grade*

**B.E. (I.T.) VII-Semester Supplementary Examinations, May/June-2023**

**Compiler Construction**

Time: 3 hours

Max. Marks: 60

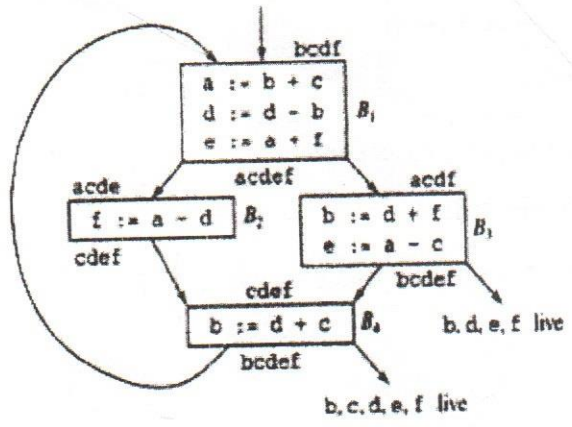
Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define preprocessor. What are the functions of pre-processor?	2	1	1	1
2.	Write the regular expression that represents Identifiers.	2	1	1	1
3.	What are the common conflicts that can be encountered in shift-reduce parsers?	2	1	2	1
4.	Draw the model of an LR parser.	2	1	2	1
5.	Why are quadruples preferred over triples in an optimizing compiler?	2	2	3	1
6.	What is a Syntax-directed definition? Give an example.	2	1	3	1
7.	Write the usage of reference counting in garbage collector.	2	1	4	1
8.	How redundant sub-expression elimination can be done at global level in a given program?	2	2	4	1
9.	Differentiate machine dependent and independent code optimization.	2	2	5	1
10.	List the issues in the design of a code generator.	2	1	5	1
<b>Part-B (5 × 8 = 40 Marks)</b>					
11. a)	How to recognize various tokens of high level language program? Write the regular expression for each token.	5	2	1	2
b)	Draw transition diagrams for each token.	3	2	1	2
12. a)	What is shift-reduce parser?	2	1	2	1
b)	Consider the following grammar: $E \rightarrow E + E, E \rightarrow E * E, E \rightarrow (E), E \rightarrow id$ . Show the shift-reduce parser action for the string $id*(id+id)$ .	6	4	2	2
13. a)	Given a grammar $G : E \rightarrow E+T   T ; T \rightarrow T * F   F ; F \rightarrow (E)   id$ . Augment G with rules such that It syntactically validate an expression having additions and multiplications in it.	5	3	3	3
b)	Find the synthesized and inherited attributes in above augmented grammar.	3	3	3	2

Contd... 2

14. a) Construct the flow graph for vector dot product program. 5    3    4    3  
 b) Discuss about optimization of basic blocks. 3    2    4    2  
 15. a) Given the below flow graph, find the minimum number of registers required to execute the code. 5    3    5    3



- b) For the above graph generate the machine code using assigned registers. 3    4    5    3  
 16. a) Explain different phases in compiler design? 4    2    1    2  
 b) Eliminate left recursion in the following grammar  $A \rightarrow ABd \mid Aa \mid aB \rightarrow Be \mid b$  4    4    2    2  
 17. Answer any *two* of the following:  
 a) What is an intermediate code? Explain different types of intermediate codes forms and represent the following statement in different forms:  $W = (A + B) - (C + D) + (A + B + C)$ . 4    4    3    2  
 b) What is the purpose of code optimization? Explain in detail loop optimization with example. 4    2    4    2  
 c) Explain in brief about peephole optimization techniques? 4    2    5    2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level - 1	20%
ii)	Blooms Taxonomy Level - 2	36%
iii)	Blooms Taxonomy Level - 3 & 4	44%

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