

System Programming & compiler construction

University of Mumbai
Examination Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

Q1 (20 Marks)	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Forward Reference Table (FRT) is arranged like
Option A:	Linked List
Option B:	Stack
Option C:	Queue
Option D:	Double Linked List
2.	Compiler can check _____ error
Option A:	Logical
Option B:	Syntax
Option C:	Both A and B
Option D:	Content
3.	Three address statement is abstract form of
Option A:	Source program
Option B:	Target program
Option C:	Intermediate code
Option D:	Either A or C
4.	_____ is designed to solve a specific problem or to do a specific task.
Option A:	Application Software
Option B:	System Software
Option C:	Utility Software
Option D:	User
5.	In a two-pass assembler, the task of the Pass II is to
Option A:	Separate the symbol, mnemonic opcode and operand fields
Option B:	Build the symbol table
Option C:	Construct intermediate code
Option D:	Synthesize the target program
6.	We can optimize code by
Option A:	Common subprogram
Option B:	Loop declaration
Option C:	Dead code elimination
Option D:	Copy intermediate loop
7.	A macro can be defined at
Option A:	Beginning of a program
Option B:	End of a program
Option C:	Anywhere in a program
Option D:	After initialization of program
8.	Match all items in Group 1 with correct options from those given in Group 2.

	Group1	Group2
	P. Regular expression Q. Pushdown automata R. Dataflow analysis S. Register allocation	1. Syntax analysis 2. Code generation 3. Lexical analysis 4. Code optimization
Option A:	P-4, Q-1, R-2, S-3	
Option B:	P-3, Q-1, R-4, S-2	
Option C:	P-3, Q-4, R-1, S-2	
Option D:	P-2, Q-1, R-4, S-3	
9.	Nested Macro calls are expanded using the	
Option A:	FIFO rule (First in first out)	
Option B:	LIFO (Last in First out)	
Option C:	FiLO rule (First in last out)	
Option D:	None of the above	
10.	Which of the following can be accessed by the transfer vector while in linking?	
Option A:	External data segments	
Option B:	External sub-routines	
Option C:	Data located in other procedure	
Option D:	None of the mentioned	

Q2 (20 Marks)	Solve any Four out of Six	5 marks each
A	Describe Conditional Macro expansion with suitable example	
B	Explain the role of code optimization in compiler design	
C	Differentiate between Application Program and System Program	
D	Remove the left recursion from the grammar $E \rightarrow E(T)T$ $T \rightarrow T(F)F$ $F \rightarrow id$	
E	Explain Forward Reference Problem and how it is handled in assembler design	
F	Write note on Dynamic linking and Loading	

Q3 (20 Marks)	Solve any Two	5 marks each
A		
i	Explain Synthesized and inherited attributes	
ii	What are the types of Assembly Language statements? Explain.	
iii	Describe MNT, MDT and ALA with respect to macro processor with example	
B	Solve any One	10 Marks
i	Explain databases used in Two pass assembler design with suitable example	
ii	Construct LL(1) Parsing table $S \rightarrow aBDh$ $B \rightarrow Cc$	

	$C \rightarrow bC \mid \epsilon$ $D \rightarrow EF$ $E \rightarrow g \mid \epsilon$ $F \rightarrow f \mid \epsilon$ Check whether the string 'acbgh' is valid or not.
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Q4 (20 Marks)	
A	Solve any Two 5 marks each
i	Explain the different ways of parameter passing in macros.
ii	Explain the role of Finite automata in compiler design.
iii	Explain different issues in code generation.
B	Solve any One 10 Marks
i	Explain working of Direct Linking loader with example showing entries in different database built by DLL.
ii	What is the need of Intermediate Code Generation? Explain any 2 intermediate code generation forms with example.