T.E. (Comps) (Sem-VI) CCBCGS 91398

System Programming & compiler construction

May-2022

University of Mumbai

Examinations Summer 2022

(R-2020-21)

Time: 2hour 30 minutes Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Identify the correct statement with respect to inherited attributes?
Option A:	The attributes can take values from the parents and from the left siblings but not the right sibling
Option B:	The attributes can take values from the parents and from the right siblings but not the left sibling
Option C:	The attribute can take value either from its parent or from its siblings.
Option D:	The attribute can only take value from its siblings.
2.	Which of the following is the graphical representation that shows the basic blocks and their successor relationship?
Option A:	Hamiltonian graph
Option B:	Control graph
Option C:	Flow graph
Option D:	DAG
3.	Rearrange the Compilation Process in the correct order:- a. Linking b. Assembling c. Pre-Processing d. Compiling
Option A:	c→d→b→a
Option B:	c→d→a→b
Option C:	d→c→b→a
Option D:	c→b→d→a
4.	What will be the **FOLLOW(A)** for following grammar? S→AaAb S→BaBb A→ε B→ε
Option A:	Only a
Option B:	a, b
Option C:	Only b
Option D:	Only ε
5.	Which technique is applicable to optimize the given code? t=c*4 for (j=0 ; j< c*4; j++) {.....}
Option A:	Constant Propagation
Option B:	Copy Propagation
Option C:	Induction Variable Reduction
Option D:	Common Sub-expression Elimination
6.	Consider the code:- **MACRO** &TEST ABC &X, &Y, &Z &TEST A 1, &X A 2, &Y A 3, &Z

	MEND LOOP1 SPCC P1,P2,P3 What will be the value in MDTC and MNTC after processing macro definition?
Option A:	MDTC = 5, MNTC =1
Option B:	MDTC = 6, MNTC =2
Option C:	MDTC = 2, MNTC =6
Option D:	MDTC = 1, MNTC =5
7.	Consider the Assembly code and Identify the type of statement: START 300 **Line -1** ADD AREG,A **Line -2** A DC '4' -- -- END
Option A:	Line -1 is Imperative Statement and Line-2 is Assembler Directive
Option B:	Line -1 is Assembler Directive and Line-2 is Declaration Directive
Option C:	Line -1 is Imperative Statement and Line-2 is Declaration Statement
Option D:	Line -1 is Declaration Directive and Line-2 is Assembler Directive
8.	Which of the following grammar is appropriate for operator precedence grammar?
Option A:	S-> EF
Option B:	S-> E*F | ε
Option C:	S-> E+F
Option D:	S-> +EF
9.	Consider the Assembly code and Identify the type of statement: START 100 **Line-1** MOVER AREG, First **Line-2** ADD AREG, Second **Line-3** MOVEM AREG, Result **Line-4** PRINT Resuit What will be the intermediate code and Current Location Counter for Line-2?
Option A:	LC = 101, Intermediate code : (IS,02) (RG,01) (S,1)
Option B:	LC = 101, Intermediate code : (IS,01) (RG,01) (S,1)
Option C:	LC = 102, Intermediate code : (IS,01) (RG,01) (S,1)
Option D:	LC = 102, Intermediate code : (IS,02) (RG,01) (S,1)
10.	In terms of relocating the loader, which of the following is used to overcome the problem of linking?
Option A:	Transfer Vector
Option B:	Relocation bits
Option C:	Transfer Array
Option D:	Program length

Q2.	
A	**Solve any Two** **5 marks each**
i.	Write a short note on Peephole Optimization.
ii.	Differentiate between Application and System Software.
iii.	What are the functions of Loader?
B	**Solve any One** **10 marks each**
i.	Explain the different phases of compiler with suitable example?
ii.	What are the different ways of representing Intermediate code? Explain with example

Q3	**Solve any Two Questions out of Three 10 marks each**

A	Consider the following Assembly Program:-
	START 501
	A DS 1
	B DS 1
	C DS 1
	READ A
	READ B
	MOVER AREG, A
	ADD AREG, B
	MOVEM AREG, C
	PRINT C
	END
	
	Generate Pass-1 and Pass-2 and also show the content of Database table involved in it.

B	Explain various Code Optimization techniques in detail.
C	Test whether the given grammar is in LL(1) or not. Construct LL(1) Parsing Table. S→AB/gDa A→ab/c B→dC C→gC/g D→fD/g Where a,b,c,d,f,g are the terminals and S,A,B,C,D are the Non-Terminals

Q4	
A	**Solve any Two** **5 marks each**
i.	Draw a neat flowchart of pass-1 of two pass assembler design
ii.	What is relocation and linking concept in Loaders
iii.	Compare Pattern, Lexeme and token with example
B	**Solve any One** **10 marks each**
i.	Draw a neat flowchart of two pass macro processor. Explain with the help of example
ii.	Explain the design of direct linking loader.