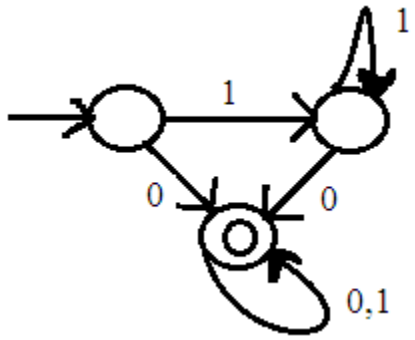
United College of Engineering and Research, Allahabad
Department of Computer Science and Engineering

1st Sessional Examination (2020-21) B.Tech. [5th Semester (CS)]

Compiler Design

Subject Code: RCS502
Time: 75 Minutes **Max. Marks:** 30

Note: There are three sections in this paper. All sections are compulsory.

Que No.	Question	Marks	CO	Bloom 's level
	Section-A			
Note: Attempt all				
a	What is cross compiler?	1*10	1	L1
b	Definition of a language L with alphabet {a} is given as following. L={a^{2nk} | k>0, and n is a positive integer constant}. What is the minimum number of states needed in DFA to recognize L?		1	L2
c	Consider the DFA given  Suppose L string is accepted by the above DFA then L' is CFG or not.		1	L2
d	A java translator written in C++ language that takes java code and produces C++ as an output. Create a Java translator in C for the same.		1	L2
e	Describe the language denoted by the following regular expression $(0+1)^*1(0+1)^*1(0+1)$		1	L1
f	Write the structure of Lex program.		1	L1
g	Define BNF Notation.		1	L1
h	Differentiate between single pass and multipass compiler.		1	L1
i	What do you mean by front end and back end in context of compiler phase?		1	L1
j	A→aB A→a B→Aa | b Is this grammar is CFG or not? Can we design a DFA for the strings generated by above grammar?		1	L1
	Section-B1			
Attempt any two.				

a.	Explain the term token, lexeme and pattern? Find the number of token in the given code fragment.
	void main()
	{
	int sum_of_two_number = 5+8;
	/*post increment and pre decrement*/
	sum_of_two_number= sum_of_two_number++ + --sum_of_two_number;
	printf("Result is %d ",sum_of_two_number);
	}
		5	1	L2

b.	Write the algorithm for moving forward pointer in "input buffering" scheme using 2-buffer and sentinel approach.	5	1	L1

c.	Design a DFA for input alphabet Σ={0,1} in which, every substring of 3 symbols has at most two zeros and all strings of length less than 3 are also in the language. For example, 001110 and 011001 are in the language, but 100010 is not.	5	1	L2
Section-C				
Attempt any one.				
a.	Explain the phases of the compiler in detail. Write down the output of each phase for the expression Interest=p*r*t/100 (where p, r ,t is float data type)	10	1	L1
a.	Write the subset construction algorithms? Draw the DFA for the R.E. (a|ba)*aa by using subset construction algorithm.	5+5	1	L1