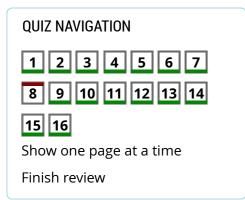
Computer Science and Engineering

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Compilers Laboratory

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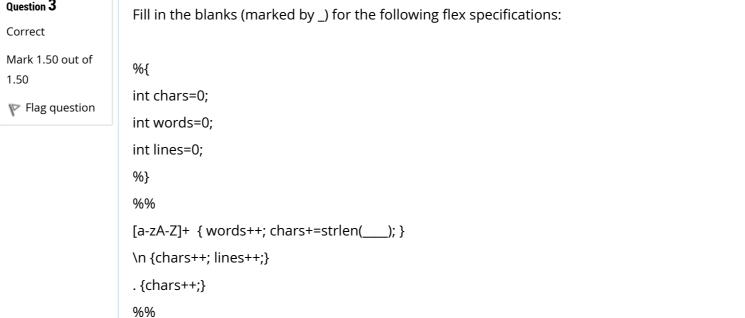
Started o	n Thursday, 18 November 2021, 4:15 PM		
Sta	te Finished		
Completed o	Thursday, 18 November 2021, 4:57 PM		
Time take	42 mins 26 secs		
Grad	le 19.00 out of 20.00 (95 %)		
C	ill in the two blanks (marked by _ starting from the 3rd character) so that the following		

Correct pattern represents a floating constant in hex format. Mark 1.00 out of 1.00 0[__]([0-9a-fA-F]*\.[0-9a-fA-F]+|[0-9a-fA-F]+\.?)[Pp][-+]?[0-9]+[flFL]? Flag question Answer: xX The correct answer is: Xx

Question 2

The following grammar is implemented in Bison (non-terminals are represented in italics).

Correct S: id = EMark 1.50 out of 1.50 E: num Flag question | *E* + num | *E* - num If we parse a sequence id = 4+3-2+8 by applying the above rule then what will be the depth of the parse tree. Answer: 5 The correct answer is: 5 Question 3 Fill in the blanks (marked by _) for the following flex specifications:



```
main(int argc,char **argv)
{
 yylex();
  printf("%d%d%d\n",lines,words,chars);
Answer: yytext
The correct answer is: yytext
In the context of Bison perform the correct match
                                                                   : (read as colon)
The separator between the left-hand side non-terminal and the
right hand side of a production rule.
                                                                   %type
Non-Terminal Symbols
Separator for multiple rules in production rule (same left had
side, different right hand side)
                                                                   %start
Start Symbol
                                                                   %token
Terminal Symbols
```

The correct answer is: The separator between the left-hand side non-terminal and the right hand side of a production rule.

-: (read as colon), Non-Terminal Symbols

Ouestion 4

Mark 2.50 out of

Flag question

Correct

2.50

 - %type, Separator for multiple rules in production rule (same left had side, different right hand side)

- |, Start Symbol
- %start, 1. Terminal Symbols %token

Question 5

Correct

Mark 2.00 out of 2.00

Flag question

1: $S \rightarrow E$

2: $E \rightarrow E + E \mid E - E \mid E * E \mid E / E \mid - E \mid E$

3: *E* -> num

4: *E* -> id

The above mentioned grammar is implemented in Bison for designing a Programmable Calculator where the precedence and functioning of the operators is as per our convention. Please pick the correct statements (enough for our purpose) from the following list and order them as per Bison so that it preserves syntax, precedence and functioning of the operators as per our convention. For example if you think (D) (H) (I) (M) is enough and follow the order as (H) (I) (M) (D) then write HIMD. There is no part marking for this question. UMINUS is used for unary minus.

```
%left '+' '-'
   (A)
          %left '*' '/'
   (B)
          %left '='
   (C)
          %left UMINUS
   (D)
          %right '+' '-'
   (E)
          %right '*' '/'
   (F)
          %right '='
   (G)
   (H)
          %right UMINUS
   (I)
          %nonassoc UMINUS
   (J)
          %nonassoc'='
   (K)
          %assoc '+' '-'
   (L)
          %assoc '*' '/'
   (M)
          %assoc UMINUS
Answer: ABI
The correct answer is: GABI
```

Ouestion **6**

Correct

Mark 1.00 out of 1.00

Flag question

In the context of Bison, if we denote unary minus as UMINUS and set the proper precedence of UMINUS with respect to other binary operators then the production rule $[E \rightarrow -E]$ can be written as:

Select one:

- a. expression: '-' expression %prec UMINUS { \$1 = -\$2; }
- b. expression: '-' expression %prec UMINUS { \$\$ = -\$2; }



o. expression: '-' expression

od. expression: '-' expression %prec UMINUS

e. expression: '-' expression

The correct answer is: expression: '-' expression %prec UMINUS

Question 7

Correct

Mark 1.00 out of 1.00

Flag question

Source program related new entries are just created at the symbol table at which phase of the compilation process?

Select one:

- a. Semantic Analysis
- b. Syntax Analysis
- c. Lexical Analysis
- d. Code Optimization

The correct answer is: Lexical Analysis

Question 8

Incorrect

State whether the following statement is True or False.

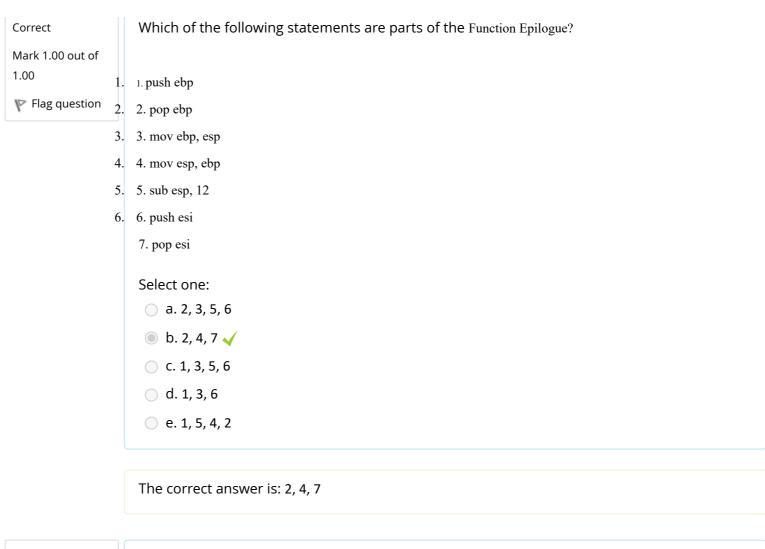
Mark 0.00 out of 1.00	Symbol table uses attribute information to apply the scope rules to an identifier.
Flag question	Select one:
•	□ True ★
	○ False
	The correct answer is 'False'.
a .: 0	
Question 9 Correct	State whether the following statement is True or False.
Mark 1.00 out of 1.00	One dedicated symbol table is created to store all the static variables if there is any.
Flag question	Select one:
	○ True
	■ False
	The correct answer is 'False'.
Question 10	At least how many separate symbol tables are required for a C program consists of four (4) functions.
Correct	Turictions.
Mark 1.00 out of 1.00	Answer: 5
Flag question	

Question 11 What is the memory size corresponding to a function's (parameters: two integer variables, return type: integer, and no new local variables are declared inside the function) entry into the symbol Correct table? For example for an integer variable it is four (4). Mark 1.00 out of 1.00 Answer: 0 Flag question The correct answer is: 0 Question 12 Fill in the blanks in the following Bison code snippet. Correct Mark 1.00 out of typedef enum 1.00 Flag question PLUS = 1,MINUS, MULT, DIV, UMINUS, } opcodeType; The correct answer is: enum Question 13 $1: B ext{ } ext{ }$ Correct 2: *B* -> *B* && *B* Mark 1.00 out of 3: *B* -> ! *B* 1.00

4: *B* ₫ ఄ (*B*)

Flag question

	$5: B ext{ } ext{ }$	
	6: <i>B</i>	
	7: <i>B</i>	
	For the above Boolean expression grammar, back-patching (after necessary augmentation of the production rules) is required for which production rules.	
	Select one:	
	a. For 6 and 7	
	○ b. For 3 and 4	
	c. For all the production rules	
	○ e. For 5	
	The correct answer is: For 1 and 2	
Question 14		
Correct	State whether the following statement is True or False.	
Mark 1.00 out of 1.00	Function Prologue and Function Epilogue is part of code translation.	
Flag question	Select one:	
	● True	
	○ False	
	The correct answer is 'True'.	
Question 15		



Question 16

Correct

Mark 1.50 out of 1.50

Flag question

In the context of translating three address code to x86, which instructions are required to call a function with one to several parameters. Select all those which are required and write them together without any punctuators/space. There is no part marking for this question.

- A. mov
- B. add
- C. sub
- D. D. idiv

E.	E. jmp	
F.	F. call	
G.	G. push	
Н.	Н. рор	
	I. lea	
	Answer: ABFG	✓
	The correct answer is: AGF	

Finish review

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