

Sample Exam - Compiler Design

CS3071

2 Hour Exam

Answer 3 out of 3 Questions

MCQ - 20% deduction for incorrect answer

Section A

1) *How many of the following 6 strings (whitespace and \n indicate a new string and are not part of the test data)*

hhh h hh hhhh hhhhhh hhhhh

are matched at least once, in part or whole, by the Flex regular expression

hhh

- This regex matches 3 consecutive h's in any order.
- **Answer: (A) -> 4**

2) *How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)*

YYYq qqqq YYYYY YYYY YY qYY YYYYYY qq qqqqq qqqYYY qqqqqq qqg YYY YYq YYYqqq

are matched at least once, in part or whole, by the Flex regular expression

q[A-Z]Y

- This regex matches 1 occurrence of the character q, followed by any occurrence of the character range A-Z ending in a Y.
- **Answer: (A) -> 2**

3) How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)

FFFFFii bbbFFii FFFFFFiii bbbFiii FFFFFFFF iFF FFFFFbbb bbbbi bbbbbii FFFbbi iiFb ibb bbbib iiiFFb FFiii

are matched at least once, in part or whole, by the Flex regular expression

b[a-zA-Z]F

- This regex matches 1 occurrence of b followed by any letter followed by F
 - Answer: (D) -> 2
-
-

4) How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)

Tddduuu dddTddd ddduuudd Tdddd uuuuuu uuuuddd TTTTTuu TTdddTTT uuTTTT uuddduu uuuddd TuuuT ddud uduu uuuu

are matched at least once, in part or whole, by the Flex regular expression

dd[a-zA-Z][a-zA-Z]+u

- This regex matches 2 consecutive d's followed by any letter, followed by one or more occurrence of any letter, followed by u
- Answer: (A) -> 3

5) How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)

jrrrr FjF rFFFF jjFFrrr rFFrr FFFrr jrrF jjjjjFFF rrjjrr rjjjj rrrjjF rFF rFjj FrrFFF FFFFFr

are matched at least once, in part or whole, by the Flex regular expression

r[a-zA-Z][a-zA-Z]?jj

- This regex matches r, followed by any letter, followed by an optional occurrence of any letter, followed by 2 j's
 - Answer: (C) -> 4
-
-

6) How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)

*hhhhLLL LLoooh LLLLLL hhhLLL oooho LLohh ohhho ooohhhh LLLLLhhh LLLLhh hhhhhhhh
oooLLLhh oLLL hhhhooo LhhL*

are matched at least once, in part or whole, by the Flex regular expression

o[a-zA-Z]{1,2}hh

- This regex matches an o followed by (1/2) occurrences of any letter followed by 2 h's
 - Answer: (B) -> 2
-
-

7) How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)

AAfA ffhA hAAhh hhAAhh fAh hhff AAfff hAf hhfA hhh Ahhhh AAhff hffhh hffh AAh

are matched at least once, in part or whole, by the Flex regular expression

(f{2,3}|hhh?)

- This regex matches (2-3) f's OR two h's followed by zero or one h
- **Answer: (B) -> 11**

8) How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)

Zzzzz zZZZZ zzzmmmmmm mmmZZZZ zZZZz zmmz mmmZZZm mZZ mmmzmm zmmmm
zzmmmm zzmmmm ZZZmmmmmm Zmmm ZZZZZZ

are matched at least once, in part or whole, by the Flex regular expression

..zZ.

- This regex matches 2 occurrences of anything followed by zZ followed by one occurrence of anything
 - **Answer: (B) -> 0**
- -----

9) How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)

qvq Qvq vQq vvQ vQv qQv Qqv qqq qqQ Qvv vqq vqQ qqv qvQ qQq

are matched at least once, in part or whole, by the Flex regular expression

$^{[a-z]}$

- This regex matches a string that starts with a letter in the range [a-z]
- Answer: (D) -> 12

10) How many of the following 15 strings (whitespace and \n indicate a new string and are not part of the test data)

ookkoo Eok EEkkk kEEo kkok koooo ooooE kooEE EEkk kKEo kooE ooEEEE koo kkkE EoEE

are matched at least once, in part or whole, by the Flex regular expression

$^{(k|E|[A-Z]+)}$

- This regex matches a string that starts a k or any capital letter
- Answer: (D) -> 12

Section B

1) How many of the following 8 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

EEEEEE EE erQ8in1 EEEEE EEE sentence EEEEEEE EEEE

are in the language defined by the Bison Context Free Grammar

```
%token E
%%
sentence: E | E sentence
;
```

- This grammar states that a sentence is the letter E OR an E followed by another sentence.
 - Answer: (D) -> 6
-
-

2) How many of the following 8 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

7IExavI M MMM MMMMM sentence MMMMMM MMMM MM

are in the language defined by the Bison Context Free Grammar

```
%token M
%%
sentence: M | M sentence
;
```

- This grammar states that a sentence is the letter M or is the letter M followed by another sentence.
- Answer: (C) -> 6

3) How many of the following 7 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

sentence hhhhhhZ hhhhZZZZ e5iPght hhhhZ hhhhZZZZ hhhhhhZZ

are in the language defined by the Bison Context Free Grammar

%token h Z

%%

sentence: sub | sub sentence

sub: h | Z

;

- This grammar states that a sentence is a singular sub (h | z) or a sub followed by another sentence.
- Answer: (C) -> 6

4) How many of the following 10 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

vvH HH vvHH vvHH vvHH vvHH vvHH vvHH vvHH vvH v

are in the language defined by the Bison Context Free Grammar

%token v H

%%

sentence: v | H | v sentence

;

- This grammar states that a sentence is a singular v or a singular H or a v followed by another sentence.
- Answer: (E) -> 4

5) How many of the following 10 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

iiiAAA iiiia iiiAA iiiA iAA ii iiA iA iiiAAAA AA

are in the language defined by the Bison Context Free Grammar

%token i A

%%

sentence: i | A | sentence i

;

- This grammar states that a sentence is a single i or A followed by one or more i's.
- Answer: (B) -> 1

6) How many of the following 10 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

uuDD uuuD uuDDDD uuD uuDDD D uDDD uuU uDDDD uuuuDD

are in the language defined by the Bison Context Free Grammar

%token u D

%%

sentence: u | D | D sentence

;

- This grammar states that a is a u or a D or a D followed by a sentence.
- Answer: (A) -> 1

7) How many of the following 10 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

cccVVVV VV ccccVV cVVV cVVVV ccc cVV cccVV ccccVVVV cccVVV

are in the language defined by the Bison Context Free Grammar

```
%token c V
%%
sentence: c | V | sentence V
;
```

- This grammar states that a sentence is a single c or V followed by one or more V's.
- Answer: (A) -> 3

8) How many of the following 7 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

PP;PPP; PPPPP;P PPPPP P;PPPPPPPP PPP;P PP;PP;P;PP P;PP

are in the language defined by the Bison Context Free Grammar

```
%token P
%%
sentence: list | sentence list
list: listc ';'
listc: P | P listc
;
```

- This grammar states that a sentence is either a single list, or multiple lists. A list is a list of P's ending in P followed by ;.
- Answer: (E) -> 1

9) How many of the following 6 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

Q,QQQ,Q Q,Q,QQ,QQQQ QQQ, Q,QQQ,QQQ QQ,Q,QQQ, QQQQ,QQ,

are in the language defined by the Bison Context Free Grammar

%token c V

%%

sentence: listc | listc ',' sentence

listc: Q | Q listc

;

- This grammar states that a sentence is a comma separated list of Q's not ending in a comma.
- **Answer: (C) -> 3**

10) How many of the following 6 sentences (whitespace and \n indicate a new sentence and are not part of the test data)

K,KK,K K,KKK; KK,KK,K,K; KKKK,K, KKKKK,K; KKKK,K

are in the language defined by the Bison Context Free Grammar

%token K

%%

sentence: commal ','

commal: listc | listc ',' commal

listc: K | K listc

;

- This grammar states that a sentence is a commal followed by ;. A commal is a singular or multiple list of K's separated by commas but not ending in a comma.
- **Answer: (E) -> 1**