Compiler Design
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Assignment 2 (Week 2)

Q1. Consider the following C-program segment.

```
main(){
        int x, y;
        x=10;
        if x > 10;
           y=2;
        else
           y=1;
        }
```

How many lexical errors are there in the segment?
(A) No lexical error
(B) One error
(C) Two errors
(D) Three errors

Ans: A

Q2. Which of the following machine model is necessary and sufficient for lexical analysis of modern computer languages?
   (A) Finite automaton
   (B) Pushdown automaton
   (C) Turing machine
   (D) None of the other options

Ans: A

Q3. Consider the following regular expressions:
   $r = a(a|b)^*$
   $s = a(a|b)^+$
   Choose the correct statement from the options given below. Here, L(r) and L(s) represent the languages generated by r and s respectively.
   (A) L(r) is a subset of L(s)
   (B) L(s) is a subset of L(r)
   (C) L(r) = L(s)
   (D) None of the other options

Ans: B

Q4. Which of the following strings is a member of the set represented by the regular expression $a(a|b)^*a$?
   (A) aabab
   (B) aababa
   (C) aaab
   (D) bababa

Ans: B

Q5. Properties followed by the strings conforming to the regular expression (0|1)*0(0|1)(0|1)(0|1) is/are:

        (A) Length at least 4
        (B) Fourth character from end is a 0
        (C) Ends with 0 or 1
        (D) All of the other options

Ans: D

Q6. Which of the following is the regular expression to represent all binary strings except empty string?

(A) $(0|1)(0|1)^*$
(B) $(0|1)^*$
(C) 01^*
(D) None of the above

Ans: A

Q7. What is the language of the grammar G: A → aB, B → aC, C → aA, C→ a
(A) a^{3i}, i>0
(B) a^+
(C) a^{2i}, i>0
(D) None of the other options

Ans: A

Q8. Which of the following is the regular expression to represent all binary strings having at least 3 characters, and the third character is 0?
(A) $0(0|1)0(0|1)^*$
(B) $1(0|1)0(0|1)^*$
(C) $(0|1)(0|1)0(0|1)^*$
(D) $(0|1)(0|1)0(0|1)$

Ans: C

Q9. How many bit strings of length exactly five are matched by the regular expression $0(0|1)^*1$?
(A) 8
(B) 10
(C) 12
(D) 14
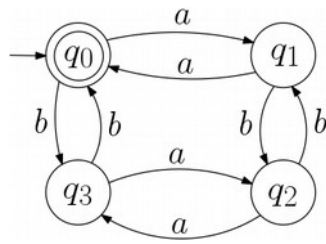
Ans: A

Q10. How many bit strings of length at most four are matched by the regular expression $0(0|1)^*1$?
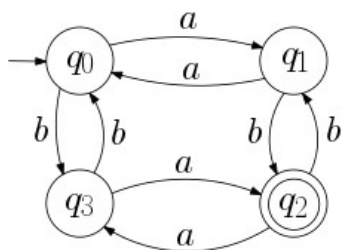(A) 5
(B) 6
(C) 7
(D) 8
Ans: C

Q11. What is the language of the following finite state machine?

(A) All strings over the alphabet {a,b} with an even number of a's and an odd number of b's
(B) All strings over the alphabet {a,b} with an even number of a's and an even number of b's
(C) All strings over the alphabet {a,b} with an odd number of a's and an odd number of b's
(D) All strings over the alphabet {a,b} with an odd number of a's and an even number of b's

Ans: B

Q12. What is the language of the following finite state machine?

(A) All strings over the alphabet {a,b} with an even number of a's and an odd number of b's
(B) All strings over the alphabet {a,b} with an even number of a's and an even number of b's
(C) All strings over the alphabet {a,b} with an odd number of a's and an odd number of b's
(D) All strings over the alphabet {a,b} with an odd number of a's and an even number of b's

Ans: C