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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Theory of Computation (course)
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Course outline

 How does an
NPTEL online
course work? ()

Week - 0 ()

Week - 1 ()

Week - 2 ()

☐ NFA, definition
and examples
(unit?
unit=25&lesson=26)

☐ Equivalence of
NFA and DFA,
Closure
properties (unit?
unit=25&lesson=27)

☐ Regular
expressions
(unit?
unit=25&lesson=28)

☐ Algebraic
properties, RE to
NFA conversion
(unit?
unit=25&lesson=29)

☐ GNFA to RE
conversion (unit?
unit=25&lesson=30)

☒ Quiz: Week 2:
Assignment 2
(assessment?
name=87)

Week 2: Assignment 2

The due date for submitting this assignment has passed.

Due on 2022-08-10, 23:59 IST.

Assignment submitted on 2022-08-10, 20:35 IST

1) The regular expression having all strings of 0's and 1's with no two consecutive 0's is?

1 point

- ☐ $(0 + 1)^*$
☐ $1 + 1^*(01)^*$
☒ $(1 + 01)^*(0 + \epsilon)$
☐ $(0 + 1)^*011$

Yes, the answer is correct.

Score: 1

Accepted Answers:

 $(1 + 01)^*(0 + \epsilon)$ 2) Consider the languages $L_1 = \{\}$ and $L_2 = \{a, \epsilon\}$. Which of the following is equivalent to $\{\epsilon\}$? 1 point

- ☐ $L_1 L_2$
☐ $L_1^* L_2$
☐ $L_1 L_2^* \cup L_1^*$
☒ L_1^*

Partially Correct.

Score: 0.5

Accepted Answers:

 $L_1 L_2^* \cup L_1^*$
 L_1^*

3) Which of the following statements is/are correct?

1 point

- ☒ There is a 2^k -state DFA for every k -state NFA.
☐ There is a k -state DFA for every 2^k -state NFA.
☒



Feedback for
Week 2 (unit?
unit=25&lesson=32)

Week - 3 ()

Week - 4 ()

Week - 5 ()

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Problem
Solving Session
()

There is a k -state NFA for every 2^k -state DFA.

☐

There is a 2^k -state NFA for every k -state DFA.

No, the answer is incorrect.

Score: 0

Accepted Answers:

There is a 2^k -state DFA for every k -state NFA.

There is a 2^k -state NFA for every k -state DFA.

4) Which of the following regular expression are equivalent?

1 point

$$R_1 : a^*(ab^* + b^*) + b^*(ba^* + a^*)$$

$$R_2 : (a^* + b^*)(a^* + b^*)$$

$$R_3 : a^* + bb^*a^*$$

$$R_4 : a^*b^* + b^*a^*$$

☒

Only R_1, R_2 and R_4 .

☐

Only R_2 and R_4 .

☐

Only R_2, R_3 and R_4 .

☐

Only R_1, R_2 and R_3 .

Yes, the answer is correct.

Score: 1

Accepted Answers:

Only R_1, R_2 and R_4 .

5) What is the regular expression for the following language :
 $L = \{w \in \{a, b\}^* \mid w \text{ has no two consecutive } a\text{'s or } b\text{'s and has at least one } a\}$

1 point

☒

$(b + \epsilon)a(ba)^*(b + \epsilon)$.

☐

$(a + \epsilon)b(ab)^*(a + \epsilon)$.

☐

$(ba)^*$.

☐

$ba(ba)^*(b + \epsilon)$.

Yes, the answer is correct.

Score: 1

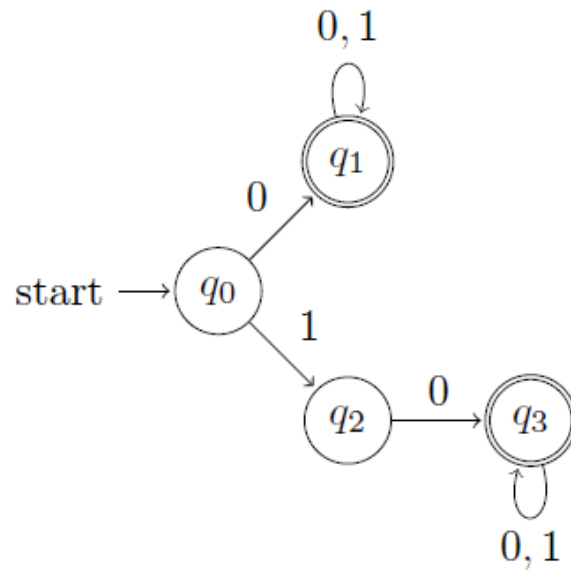
Accepted Answers:

$(b + \epsilon)a(ba)^*(b + \epsilon)$.

6) What is the regular expression corresponding to the following NFA?

1 point





- ☐ $0(0+1)^* + 1(0+1)^*.$
- ☐ $(0+1)(1+0)^*.$
- ☐ $(0+1)0(0+1)^*.$
- ☒ $(1+\epsilon)0(0+1)^*.$

Yes, the answer is correct.

Score: 1

Accepted Answers:

$(1+\epsilon)0(0+1)^*.$

7) Which of the following regular expression does not contain a string w , such that w has 0 in the end and has even number of 0's? **1 point**

- ☐ $0^*(1^*0)^*.$
- ☐ $0^*100^*.$
- ☒ $0^*1 + 1^*0.$
- ☐ $0^*(10 + 01)^*.$

Yes, the answer is correct.

Score: 1

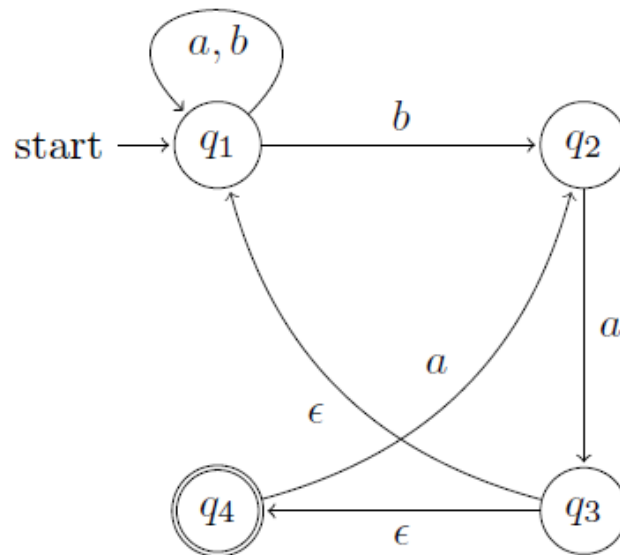
Accepted Answers:

$0^*1 + 1^*0.$

8) Consider the following NFA :

1 point





Which of the following regular expression corresponds to the language accepted by the automaton?

- ☐ $(a + b)^*aba.$
- ☐ $(a + b)^*ba^*.$
- ☒ $(a + b)^*ba(aa)^*.$
- ☐ $(a + b)^*baa^*.$

Yes, the answer is correct.

Score: 1

Accepted Answers:

$(a + b)^*ba(aa)^*.$

9) Regular languages are not closed under which of the following operation :

1 point

- ☐ Concatenation.
- ☐ Intersection.
- ☐ Set Difference.
- ☒ Subset.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Subset.

10) Which of the following languages over the alphabet $\{0, 1\}$ are not recognized by a DFA with three **1 point** states?

- ☐ Strings which do not have 11 as a contiguous subword.
- ☐ Binary representations of multiples of three.
- ☒ Strings that do not contain 101 as a contiguous subword.
- ☒ Strings ending with 100.

Yes, the answer is correct.

Score: 1

Accepted Answers:

Strings that do not contain 101 as a contiguous subword.



Strings ending with 100.

