Branch: CSE/IT

Batch: Hinglish

Theory of Computation Finite Automata

DPP-03

[MCQ]

1. For $L = \{a^n b^m | n, m \ge 0\}$

What will be the regular expression?

(a) $(a^*b^*)^*$

(b) a* b*

(c) (ab)*

(d) b*a*

[MCQ]

2. Consider the following regular expressions:

(I) $(aa + aaa)^* = aa^+$

(II) (a*b (a + b)* + (a*b*)*) = (a + b)*

(III) $(\varepsilon + aaa (aaa)^*) (\varepsilon + a + aa) = (a + aa + aaa)^*$

Which the following is correct?

(a) (I) and (III) only.

(b) (II) and (III) only.

(c) All are correct.

(d) None of them are correct.

[MSQ]

3. Which of the following is/are regular expression for the language:

 $L = \{ containing ab as a substring \}$

(a) $b^* aa^*b (a^*b^*)^*$

(b) $(a + b)^* (ab)^* (a + b)^*$

(c) (a*b*)*ab(a*+b*)*

(d) (a + b)* ab (a + b)*

[MCQ]

4. What will be the regular expression for $L = \{a^{2n} | n \ge 1\}$

15} over $\Sigma = \{a\}$

(a) $a^{15}(aa)^*$

(b) $(aa)^* a^{15}$

(c) $a^{30} (aa)^*$

(d) None of these

MCQ]

5. Which of the following string does not belong to $(ab^*)^*$?

(a) aaabbaa

(b) baaaabb

(c) aaabbb

(d) ababa

Answer Key

(b) 1.

2. **(b)**

3. (a, c, d)

4. (c) 5. (b)



Hints and solutions

- 1. (b) Regular expression for $L = \{a^nb^m | n, m \ge 0\} = a^*b^*$
- **2. (b)**

False: $(aa + aaa)^* = (aa)^*$

True: (a*b (a+b)* + (a*b*)*) = (a+b)*

True: $(\varepsilon + aaa (aaa)^*) (\varepsilon + a + aa) = (a + aa + aaa)^*$

- 3. (a, c, d)
- b* aa*b (a*b*)* will generate all the strings which content ab as substring.

- (a* b*)* ab (a* + b*)* will generate all the strings which content ab as substring.
- $(a + b)^*$ ab $(a + b)^*$ will generate all the strings which content ab as substring.
- 4. (c) Regular expression for $L = \{a^{2n} \mid n \ge 15\} = (aa)^* a^{30}$ = a^{30} (aa)*
- **5.** (b)

baaaabb is not present in (ab*)*.



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