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CS402

Final Term Examination – Spring 2006

Time Allowed: 150 Minutes

Question No. 1

Marks : 1

A production of the form non-terminal \rightarrow non-terminal is called a dead Production.

1. True
2. False

Question No. 2

Marks : 3

Semi-word is a string having some terminals and one non-terminal at the right of string.

1. True
2. False

Question No. 3

Marks : 3

Two FAs are equivalent if they have same no. of states.

1. True
2. False

Question No. 4

Marks : 1

There exist exactly two different derivations in an ambiguous CFG for a word.

1. True
2. False

Question No. 5

Marks : 1

Construct RE's for following languages over $\Sigma = \{a, b\}$

- i. All words which contain substring "baba". [5]

- ii. All words which never end in substrings “aa” and “ab” [5]

Question No. 6

Marks : 1

Regular languages are closed under Union, Concatenation and Kleene star.

1. True
2. False

Question No. 7

Marks : 1

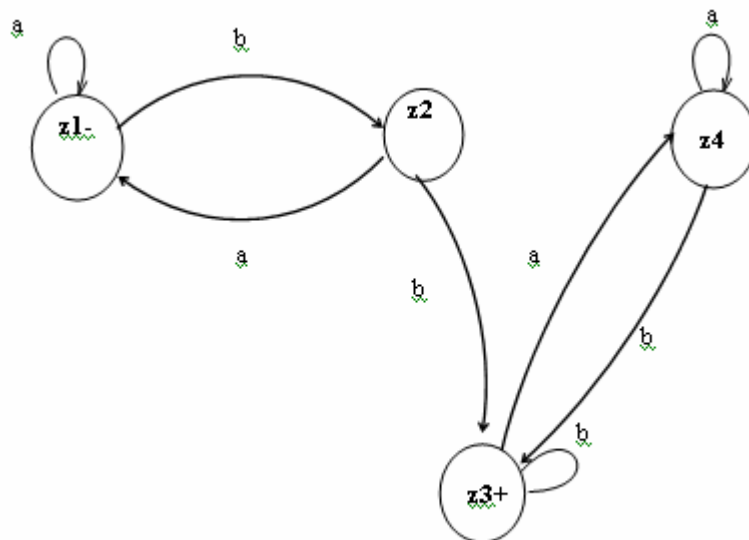
CFG may also represent a regular language.

1. True
2. False

Question No. 8

Marks : 1

Find the complement of the FA below,



Question No. 9

Marks : 1

PDA is stronger than FA.

3. True
4. False

Question No. 10

Marks : 3

Union of two FAs is an FA that accepts all the string of FA1 and FA2.

True

False

Question No. 11

Marks : 3

Given a CFG below,

- a) Remove Unit productions from the CFG. [5]

$$\begin{aligned} S &\rightarrow S + T \mid T \\ T &\rightarrow T * F \mid F \\ F &\rightarrow (S) \mid a \end{aligned}$$

- b) Derive CNF corresponding to the CFG given below. [10]

$$\begin{aligned} S &\rightarrow ABa \\ A &\rightarrow aab \end{aligned}$$

Question No. 12

Marks : 10

In non-deterministic PDA a string may be traced by more than one paths.

1. True
2. False

Question No. 13

Marks : 1

There always exist an FA for each PDA.

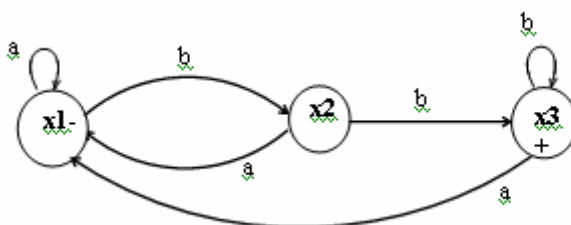
True

False

Question No. 14

Marks : 1

- a) Given an FA below, [5]



What is language accepted by above FA?

b) Draw a non-deterministic PDA for the above FA. [10]