



**CS402- Theory of Automata**  
Solved MCQS  
From Midterm Papers

**Dec 03,2012**

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PSMD01

**MIDTERM EXAMINATION**  
**Spring 2010**  
**CS402- Theory of Automata**

**Question No: 1 ( Marks: 1 ) - Please choose one**

$\Sigma = \{a, Aa, Abb\}$ , then string  $aAaAbbAa$  has \_\_\_\_\_ length.

- ▶ One
- ▶ Two
- ▶ Three
- ▶ **Four (Page 4)**

**Question No: 2 ( Marks: 1 ) - Please choose one**

Languages generated by kleene star are always \_\_\_\_\_.

- ▶ Finite
- ▶ **Infinite (Page 7)**
- ▶ Sometimes finite & sometimes infinite
- ▶ None of the these

**Question No: 3 ( Marks: 1 ) - Please choose one**

Let  $S = \{aa, bb\}$  be a set of strings then  $s^*$  will have

- ▶  **$\Lambda$  (Page 7)**
- ▶ abba
- ▶ aabbaa
- ▶ bbaab

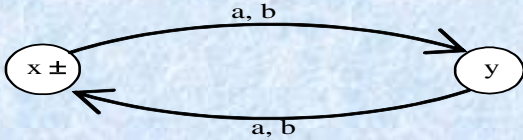
**Question No: 4 ( Marks: 1 ) - Please choose one**

If  $r_1 = (aa + bb)$  and  $r_2 = (a + b)$  then the language  $(aa + bb)^*$  will be generated by

- ▶  $(r_1)(r_2)$
- ▶  $(r_1 + r_2)$
- ▶  $(r_2)^*$
- ▶  **$(r_1)^*$  (Page 10)**

دنیا میں سب سے مشکل کام اپنی اصلاح اور سب سے آسان کام دوسروں پر نکتہ چینی کرنا ہے

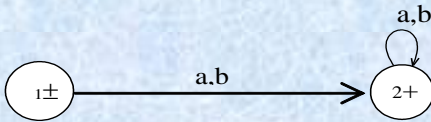
**Question No: 5 ( Marks: 1 ) - Please choose one**



Above given FA can be represented by

- ▶  **$((a + b)(a + b))^*$  (Page 13)**
- ▶  $(a + b)(a + b)^*$
- ▶  $(a + b)(a + b)$
- ▶  $(a + b)^*(a + b)^*$

**Question No: 6 ( Marks: 1 ) - Please choose one**



Above given FA accepts \_\_\_\_\_ strings defined over  $\Sigma = \{a, b\}$

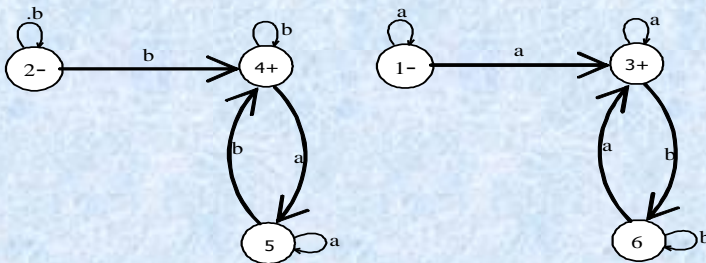
- ▶ **All (Page 15)**
- ▶ Some
- ▶ All but not null
- ▶ None of these

**Question No: 7 ( Marks: 1 ) - Please choose one**

If a language can be expressed through FA, then it can also be expressed through TG.

- ▶ **True (Page 25)**
- ▶ False
- ▶ Depends on language
- ▶ None of the above

**Question No: 8 ( Marks: 1 ) - Please choose one**

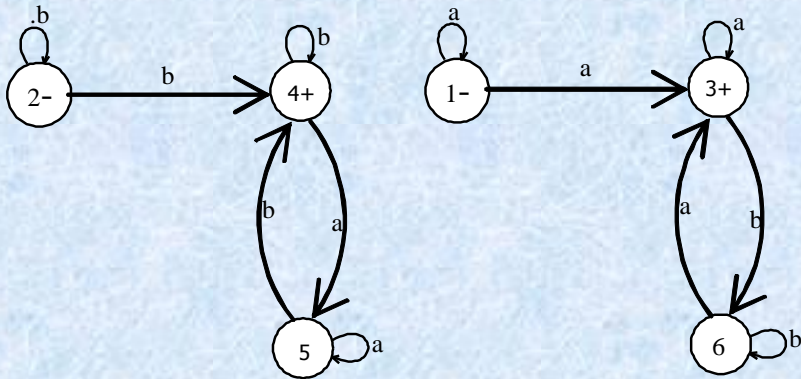


Above given TG has \_\_\_\_\_ RE.

- ▶  $a + b + a(a + b)^*a + b(a + b)^*b$
- ▶  $a(a + b)^*a + b(a + b)^*b$
- ▶ both are given
- ▶ **none of the given**

خدا کے سوا کسی سے امید مت رکھو

**Question No: 9 ( Marks: 1 ) - Please choose one**



Above given FA accepts the language in which strings

- ▶ **Begins with and ends in same letter**
- ▶ Begins with and ends in different letter
- ▶ Has length more than 2
- ▶ None of the given

**Question No: 10 ( Marks: 1 ) - Please choose one**

GTG can have \_\_\_\_\_ final state.

- ▶ 0
- ▶ 1
- ▶ More than 1
- ▶ **All of the given** [Click here for detail](#)

**Question No: 11 ( Marks: 1 ) - Please choose one**

In GTG, if a state has more than one incoming transitions from a state. Then all those incoming transitions can be reduced to one transition using \_\_\_\_\_ sign

- ▶ -
- ▶ **+** (Page 27)
- ▶ \*
- ▶ None of the given

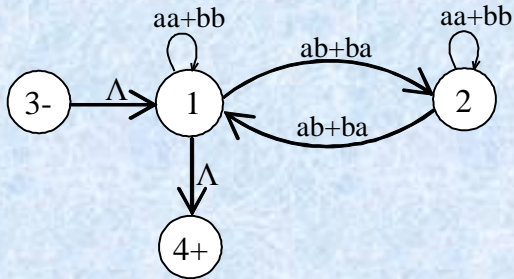
**Question No: 12 ( Marks: 1 ) - Please choose one**

“One language can be expressed by more than one NFA”. This statement is \_\_\_\_\_.

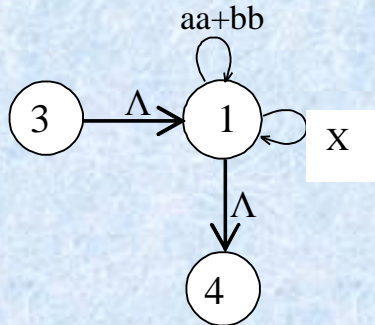
- ▶ False
- ▶ **True** (Page 41)
- ▶ Depends on NFA
- ▶ None of the given

اللہ کا خوف سب سے بڑی دانائی ہے

**Question No: 13 ( Marks: 1 ) - Please choose one**



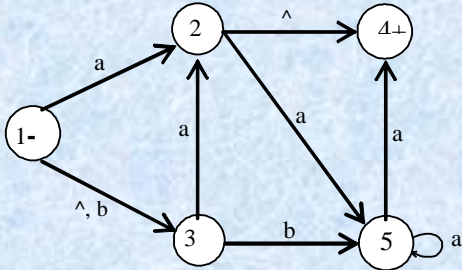
If above given TG is drawn like



Then what will be written in place of X.

- ▶ (ab+ba)(aa+bb)(ba+ab)
- ▶ (ab+ba)(aa+bb)(ab+ba)
- ▶ **(ab+ba)(aa+bb)\*(ab+ba)** (Page 31)
- ▶ (ab+ba)(aa+bb)(ab+ba)\*

**Question No: 14 ( Marks: 1 ) - Please choose one**



Above given structure is an \_\_\_\_\_.

- ▶ FA
- ▶ NFA
- ▶ **NFA -<sup>Λ</sup>** (Page 42)
- ▶ TG

بری صحبت سے تنہائی بہتر ہے اور تنہائی سے نیک صحبت بہتر ہے

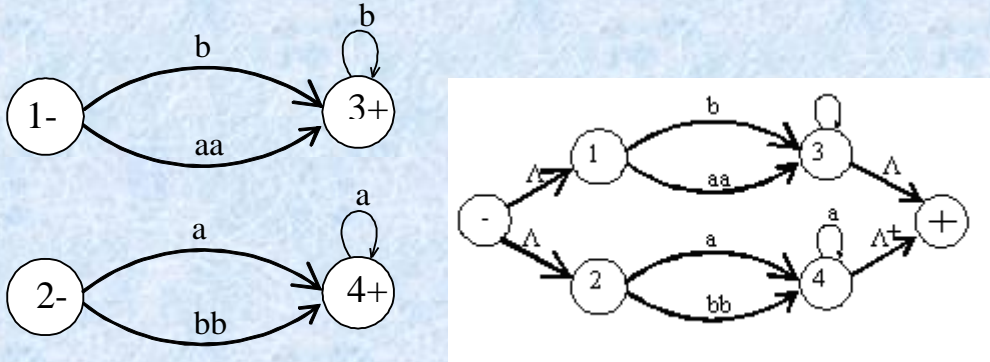
**Question No: 15 ( Marks: 1 ) - Please choose one**

One FA has 3 states and 2 letters in the alphabet. Then FA will have \_\_\_\_\_ number of transitions in the diagram

- ▶ 4
- ▶ 5
- ▶ 7

▶ 6 (Page 14)

**Question No: 16 ( Marks: 1 ) - Please choose one**



Above given two TG's are \_\_\_\_\_.

- ▶ **Equivalent** (Page 26 - 27)
- ▶ None-equivalent
- ▶ Not valid
- ▶ None of the given

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**Question No: 1 ( Marks: 1 ) - Please choose one**

If an alphabet has n number of letter, then number of strings of length m will be

- ▶ n+m
- ▶ (n)(m)
- ▶ m^n

▶ **n^m** (Page 6)

ایماندار کو غصہ دیر سے آتا ہے اور جلدی دور ہو جاتا ہے

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**Question No: 2 ( Marks: 1 ) - Please choose one**

Languages generated by kleene star are always \_\_\_\_\_.

- ▶ Finite
- ▶ **Infinite (Page 7) rep**
- ▶ Sometimes finite & sometimes infinite
- ▶ None of the these

**Question No: 3 ( Marks: 1 ) - Please choose one**

$1^*(1 + \Lambda) = 1^*$  this statement is

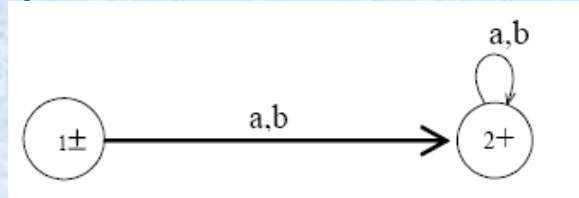
- ▶ **True**
- ▶ False
- ▶ Sometimes true & sometimes false
- ▶ None of these

**Question No: 4 ( Marks: 1 ) - Please choose one**

$a^*b^* = (ab)^*$  this expression is \_\_\_\_\_

- ▶ True
- ▶ **False**
- ▶ Can't be assumed
- ▶ None of these

**Question No: 5 ( Marks: 1 ) - Please choose one**



Above given FA can be expressed as \_\_\_\_\_

- ▶  **$(a + b)^*$  (Page 19)**
- ▶  $a^* + b^*$
- ▶  $(ab + ba)^*$
- ▶ None of these

**Question No: 6 ( Marks: 1 ) - Please choose one**

If a language is expressed through TG, then that language will have its RE.

- ▶ **True (Page 25)**
- ▶ False
- ▶ Depends on language
- ▶ None of these

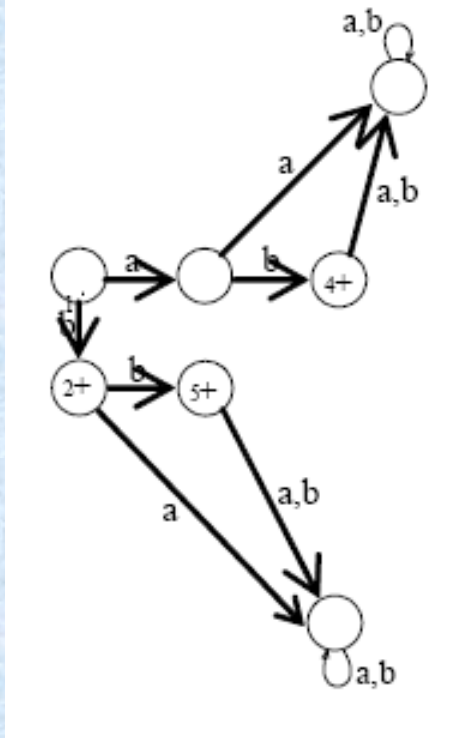
زندگی میں کامیابی کا یہی راز ہے کہ پریشانیوں سے پریشان مت بنو

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Question No: 7 ( Marks: 1 ) - Please choose one



Above given FA accepts \_\_\_\_\_ language.

- ▶ **Finite** (Page 17)
- ▶ Infinite
- ▶ Depends on alphabet
- ▶ None of these

Question No: 8 ( Marks: 1 ) - Please choose one

In TG there may exist more than one path for certain string.

- ▶ **True** (Page 25)
- ▶ False
- ▶ Depends on the language
- ▶ None of these

Question No: 9 ( Marks: 1 ) - Please choose one

In TG there may exist no paths for certain string.

- ▶ **True** (Page 25)
- ▶ False
- ▶ Depends on the language
- ▶ None of these

دنیا کی سب سے بڑی فتح نفس پر قابو رکھنا ہے

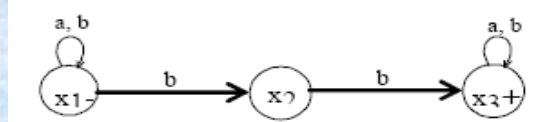
**Question No: 10 ( Marks: 1 ) - Please choose one**

GTG can have \_\_\_\_\_ final state.

- ▶ 0
- ▶ 1
- ▶ More than 1

▶ **All of the given**      [Click here for detail](#)      Rep

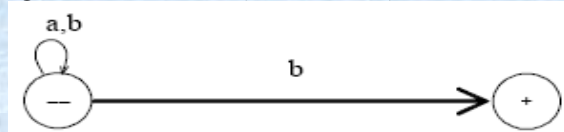
**Question No: 11 ( Marks: 1 ) - Please choose one**



Above given diagram is an NFA. If we convert it into an FA using transition table, then new FA will be consisted on \_\_\_\_\_ number of states.

- ▶ 6
- ▶ 5
- ▶ **4 (Page 45)**
- ▶ 3

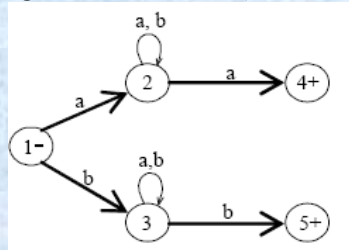
**Question No: 12 ( Marks: 1 ) - Please choose one**



Above given TG accepts the language in which all strings

- ▶ **Ends in b**
- ▶ Begins with b
- ▶ Ends and begins with b
- ▶ None of the given

**Question No: 13 ( Marks: 1 ) - Please choose one**



Above given TG has \_\_\_\_\_ RE.

- ▶  $a(a + b)^*b + b(a + b)^*a$
- ▶  $b(b + a)^*a + b(a + b)^*a$
- ▶ None of these
- ▶  **$a(a + b)^*a + b(a + b)^*b$**

جھوٹ انسان اور ایمان دونوں کا دشمن ہے



**Question No: 14 ( Marks: 1 ) - Please choose one**

Every FA should be \_\_\_\_\_

- ▶ **Deterministic (Page 25)**
- ▶ Non- Deterministic
- ▶ Deterministic & Non- Deterministic
- ▶ None of these

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**Question No: 1 (Marks: 1) - Please choose one**

Auto Meta mean

- ▶ Manual work
- ▶ **Automatic work (Page 3)**

**Question No: 2 (Marks: 1) - Please choose one**

$S = \{a, bc, cc\}$  has the letters

- ▶ 1
- ▶ 2
- ▶ **3**
- ▶ 4

**Question No: 3 (Marks: 1) - Please choose one**

$S = \{a, bb, bab, baabb\}$  set of strings then  $S^*$  will not have

- ▶ **baba**
- ▶ baabbab
- ▶ bbaaabb
- ▶ bbbaabaabb

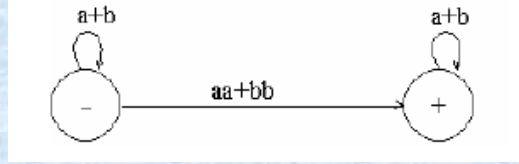
**Question No: 4 (Marks: 1) - Please choose one**

One language can represents more than one RE.

- ▶ **True (Page 9)**
- ▶ Falss
- ▶ Can't be assumed
- ▶ Non of given

عقل مند کہتا ہے میں کچھ نہیں جانتا جبکہ بے وقوف کہتا ہے کہ میں سب کچھ جانتا ہوں

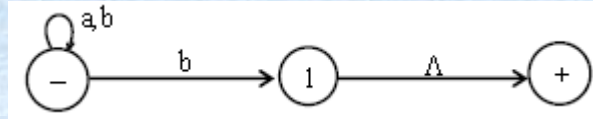
**Question No: 5 (Marks: 1) - Please choose one**



Given GTG has RE

- ▶  $(a+b)^*(aa+bb)(a+b)^*$  (Page 24)
- ▶ None of option

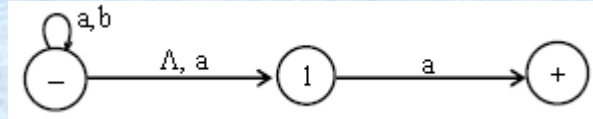
**Question No: 6 (Marks: 1) - Please choose one**



NFA accept \_\_\_\_\_String

- ▶ b
- ▶ babab
- ▶ baaab
- ▶ all (Page 43)

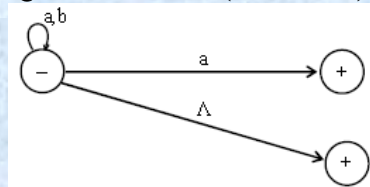
**Question No:7 (Marks: 1) - Please choose one**



NFA accept \_\_\_\_\_String

- ▶ bab
- ▶ a
- ▶ aba
- ▶ a & aba (Page 43)

**Question No: 8 (Marks: 1) - Please choose one**



TG has

- ▶  $(a+b)^*$
- ▶  $\Lambda+(a+b)^*a$  (Page 20)
- ▶  $\Lambda+(a+b)^*a^*$
- ▶ None of given

خود کو تمہیں سے بڑھ کر کوئی اچھا مشورہ نہیں دے سکتا

**Question No: 9 (Marks: 1) - Please choose one**

TG can more than one initial state

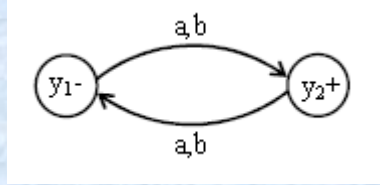
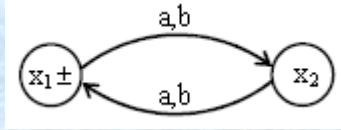
▶ True (Page 26)

▶ False

▶ Depend on alphabets

▶ None of given

**Question No:10 (Marks: 1) - Please choose one**



RE will be

▶  $(a+b)^*$

▶  $(a+b)^*(a^*+b^*)$

▶ None of the given (Page 37)

Ref:- regular expression corresponding to above two FA's can be  $(a+b)((a+b)(a+b))^*$  or  $((a+b)(a+b))^*(a+b)$

**Question No: 11 (Marks: 1) - Please choose one**

The clouser FA\*(star on an FA ) always accept \_\_\_\_\_ string

▶ Null (Page 7)

▶ aa

▶ bb

▶ None of given

**Question No: 12 (Marks: 1) - Please choose one**

In FA final state represent by \_\_\_\_\_ sign

▶ +

▶ -

▶ =

▶ \*

**Question No: 13 (Marks: 1) - Please choose one**

In FA one enter in specific stat but there is no way to leave it then state is called

▶ Dead States

▶ Waste Baskets

▶ Davey John Lockers

▶ All of above (Page 17)

جو لوگوں کے سامنے فخر کرتا ہے وہ لوگوں کی نظروں سے گر جاتا ہے

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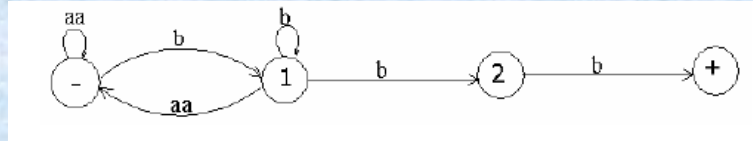
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**Question No: 14 (Marks: 1) - Please choose one**

Using tree structure final state represent by

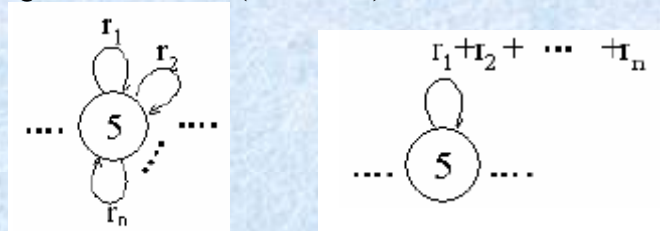
- ▶ \*
- ▶ -
- ▶ **double circle** (Page 13)
- ▶ None of given

**Question No: 15 (Marks: 1) - Please choose one**



- ▶ **a's occur only in even clumps and that ends in three or more b's** (Page 22)
- ▶ length larger then 2
- ▶ it does not accept any language
- ▶ none of given option

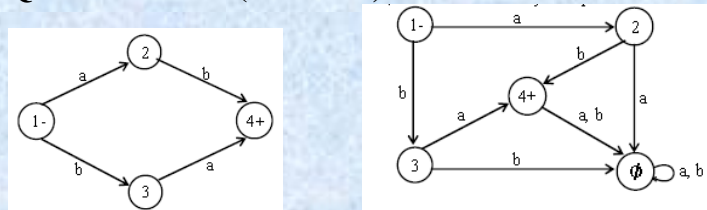
**Question No: 16 (Marks: 1) - Please choose one**



These GTG are \_\_\_\_\_

- ▶ **Equal** (Page 27)
- ▶ Not equal
- ▶ Not valid
- ▶ None of given

**Question No: 17 (Marks: 1) - Please choose one**



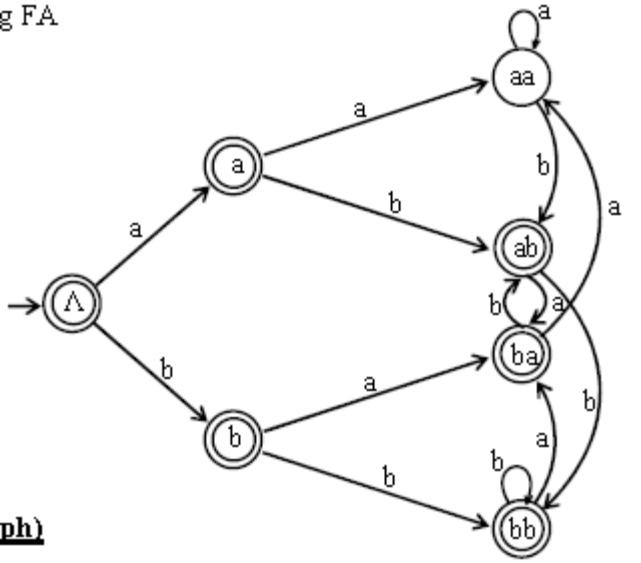
NFA to FA will \_\_\_\_\_

- ▶ **Equal** (Page 43)
- ▶ Not equal
- ▶ Not valid
- ▶ None of given

جو شخص ناکامیوں سے ڈر کر بھگتا ہے کامیابی اس سے ڈر کر بھگتی ہے

**Question No: 18 (Marks: 1) - Please choose one**

g FA



ph)

FA having RE \_\_\_\_\_

$\Lambda + a + b + (a+b)^*(ab+ba+bb)$  (Page 18)

$a + b + (a+b)^*(ab+ba+bb)$ .

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**Question No: 1 (Marks: 1) - Please choose one**

Length of strings, generated by infinite language is \_\_\_\_\_

▶ finite (Page 7)

▶ infinite

▶ none of these

Ref:- By infinite language, it is supposed that the language contains infinite many words, each of finite length

**Question No: 2 (Marks: 1) - Please choose one**

RE for the language defined over  $\Sigma = \{a,b\}$  having words starting with a is \_\_\_\_\_

▶  $a(a+b)^*$  (Page 12)

▶  $(a+b)^*a$

▶  $(a+b)^*$

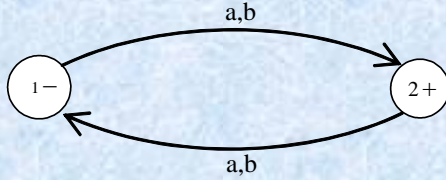
▶ None of these

بد صورت چہرہ بد صورت دماغ سے بہتر ہے

**Question No: 3 (Marks: 1) - Please choose one**  
“Every Infinite language is regular” this statement is

- ▶ True (Page 11)
- ▶ False

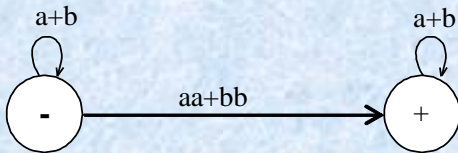
**Question No: 4 (Marks: 1) - Please choose one**



Above given FA accepts the null string

- ▶ True
- ▶ False

**Question No: 5 (Marks: 1) - Please choose one**



Above given GTG accepts the language in which strings

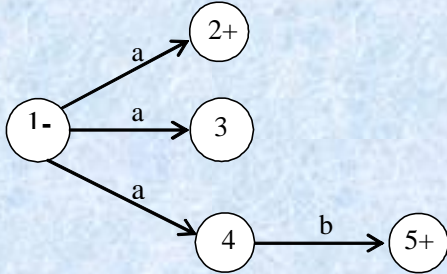
**Contains double a or double b (Page 24)**

Contains both a and double b

Depends on the alphabet

None of these

**Question No: 6 (Marks: 1) - Please choose one**



Above given NFA accepts the \_\_\_\_\_ number of strings

- ▶ one
- ▶ two (Page 40)
- ▶ three
- ▶ four

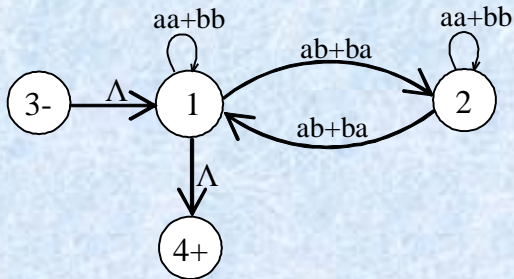
عقل مند اپنے عیب خود دیکھتا ہے اور بیوقوفوں کے عیب دنیا دیکھتی ہے

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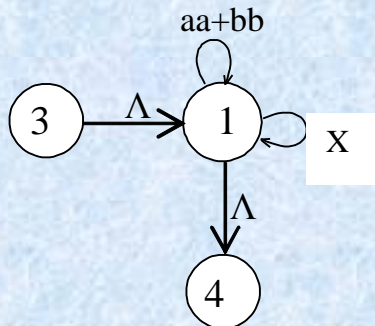
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**Question No: 7 (Marks: 1) - Please choose one**



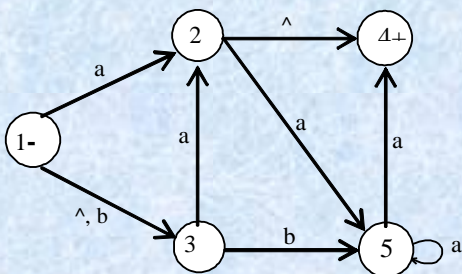
If above given TG is drawn like



Then what will be written in place of X.

- ▶ (ab+ba)(aa+bb)(ba+ab)
- ▶ (ab+ba)(aa+bb)(ab+ba)
- ▶ **(ab+ba)(aa+bb)\*(ab+ba)** (Page 31) rep
- ▶ (ab+ba)(aa+bb)(ab+ba)\*

**Question No: 8 (Marks: 1) - Please choose one**



Above given structure is an \_\_\_\_\_.

- ▶ FA
- ▶ NFA
- ▶ **NFA - Δ** (Page 42) rep
- ▶ TG

عقل مند آدمی اس وقت تک نہیں بولتا جب تک خاموشی نہیں ہو جاتی

**Question No: 9 (Marks: 1) - Please choose one**

TG is always deterministic.

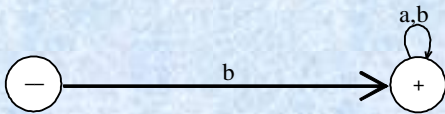
- ▶ True
- ▶ False (Page 25)

**Question No: 10 (Marks: 1) - Please choose one**

The length of output string in case of \_\_\_\_\_ is one more than the length of corresponding input string.

- ▶ Finite Automaton (Page 55)
- ▶ TG
- ▶ GTG

**Question No: 11 (Marks: 1) - Please choose one**



Above given TG accepts the \_\_\_\_\_ string.

- ▶ bb
- ▶ baba
- ▶ bbba
- ▶ all of the given options (Page 19)

**Question No: 12 (Marks: 1) - Please choose one**

If in an NFA,  $\wedge$  is allowed to be a label of an edge then that NFA is called \_\_\_\_\_.

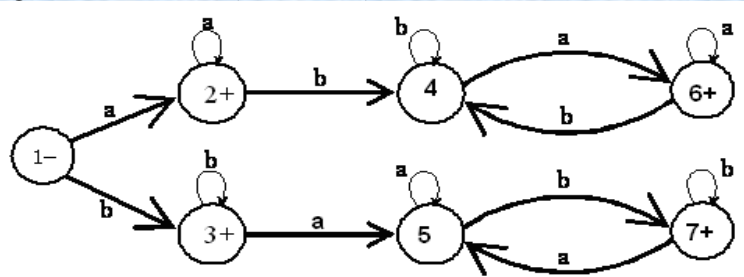
Will not remain NFA

NFA with

**NFA with null string (Page 42) rep**

Either "NFA with null string" OR "NFA with "

**Question No: 13 (Marks: 1) - Please choose one**



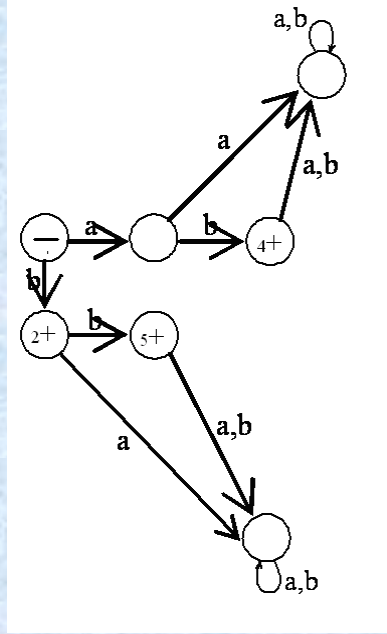
Above given FA generates the strings which \_\_\_\_\_

- ▶ Starting and ending with same letters
- ▶ Starting and ending with different letters
- ▶ None of these

بہترین تجربہ وہ ہے جس سے نصیحت حاصل ہو



Question No: 14 (Marks: 1) - Please choose one



Above given FA accepts \_\_\_\_\_ language.

- ▶ Finite (Page 17) rep
- ▶ Infinite
- ▶ Depends on alphabet
- ▶ None of these

### MIDTERM EXAMINATION

Spring 2009

CS402- Theory of Automata (Session - 3)

Question No: 1 ( Marks: 1 ) - Please choose one

Length of null string is

- ▶ Always not equal to 0
- ▶ Always equal to 0 [click here for detail](#)
- ▶ It has variable length
- ▶ All are true

انسان دکھ نہیں دیتے بلکہ انسانوں سے وابستہ امیدیں دکھ دیتی ہیں

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**Question No: 2 ( Marks: 1 ) - Please choose one**

If an alphabet has n number of letter, then number of strings of length m will be

- ▶  $n+m$
- ▶  $(n)(m)$
- ▶  $m^n$
- ▶  $n^m$  (Page 6) rep

**Question No: 3 ( Marks: 1 ) - Please choose one**

Languages generated by kleene star are always \_\_\_\_\_.

- ▶ Finite
- ▶ Infinite (Page 7) rep
- ▶ Sometimes finite & sometimes infinite
- ▶ None of the these

**Question No: 4 ( Marks: 1 ) - Please choose one**

“Every finite language can be expressed by FA”. This statement is \_\_\_\_\_.

- ▶ True
- ▶ False
- ▶ Depends on language
- ▶ None of these

**Question No: 5 ( Marks: 1 ) - Please choose one**

In FA, if one enters in a specific state but there is no way to leave it, then that specific state is called

- ▶ Dead States
- ▶ Waste Baskets
- ▶ Davey John Lockers
- ▶ All of these (Page 17)

**Question No: 6 ( Marks: 1 ) - Please choose one**

In TG there may exist no paths for certain string.

- ▶ True (Page 25) rep
- ▶ False
- ▶ Depends on the language
- ▶ None of these

**Question No: 7 ( Marks: 1 ) - Please choose one**

In GTG's there may exist no path for a certain string.

- ▶ True (Page 25)
- ▶ False
- ▶ Depends on alphabet
- ▶ None of these

فتنہ انگیز سپائی سے مصلحت آمیز جھوٹ بہتر ہے

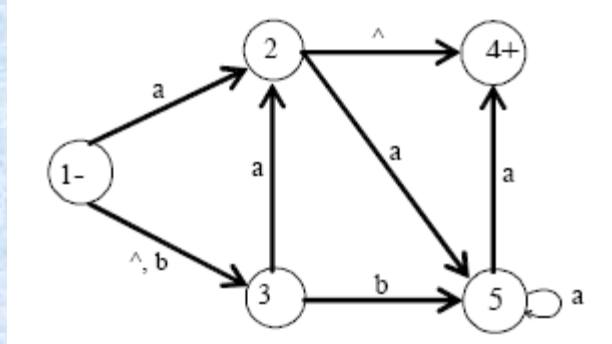
**Question No: 8 ( Marks: 1 ) - Please choose one**

In drawing FA3 (which is equal to FA1 + FA2), a state will be declared final if

- ▶ States of both FA's are final
- ▶ **At least one state is final (Page 32)**
- ▶ Depends on language
- ▶ None of the given

Ref:- Let FA3 be an FA corresponding to  $r_1r_2$ , then the initial state of FA3 must correspond to the initial state of FA1 and the final state of FA3 must correspond to the final state of FA2.

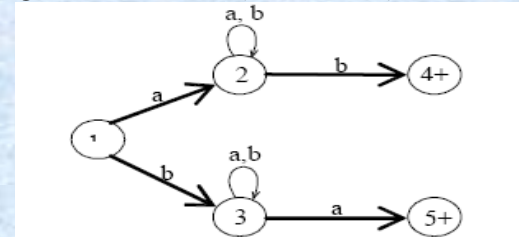
**Question No: 9 ( Marks: 1 ) - Please choose one**



Above given structure is an \_\_\_\_\_.

- ▶ FA
- ▶ NFA
- ▶ **NFA -^ (Page 42) rep**
- ▶ TG

**Question No: 10 ( Marks: 1 ) - Please choose one**



- ▶ Above given TG represents the language \_\_\_\_\_
- ▶ Begins and ends with same letters
- ▶ **Begins and ends with different letters (Page 21)**
- ▶ Begins with a
- ▶ None of these

خوبصورتی علم و ادب سے ہوتی ہے لباس و حسن سے نہیں

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**Question No: 11 ( Marks: 1 ) - Please choose one**

In TG, there may be a transition for null string.

▶ **True (Page 18)**

- ▶ False
- ▶ Can't show transition for string
- ▶ None of these

Ref:- Finite set of transitions that show how to go from one state to another based on reading specified substrings of input letters, possibly even the null string ( $\Lambda$ ).

**Question No: 12 ( Marks: 1 ) - Please choose one**

The \_\_\_\_\_ machine helps in building a machine that can perform the addition of binary numbers.

▶ **Incrementing (Page 60)**

- ▶ Complementing
- ▶ Decrementing
- ▶ None of the given

**Question No: 13 ( Marks: 1 ) - Please choose one**

▶ GTG can have \_\_\_\_\_ initial state.

- ▶ Zero
- ▶ One
- ▶ More than One

▶ **One OR more than One (Page 23)**

Ref:- Finite number of states, at least one of which is start state and some (maybe none) final states.

**Question No: 14 ( Marks: 1 ) - Please choose one**

One FA has n states and m letters in the alphabet. Then FA will have \_\_\_\_\_ number of transitions in the diagram.

- ▶ (n)+(m)
- ▶ **(m)(n) OR (n)(m)**
- ▶ None of the given options
- ▶ (m)-(n)

**Question No: 15 ( Marks: 1 ) - Please choose one**

If L1 and L2 are expressed by regular expressions r1 and r2, respectively then the language expressed by r1 + r2 will be \_\_\_\_\_

▶ **Regular (Page 10)**

- ▶ Ir-regular
- ▶ Can't be decided
- ▶ Another Language which is not listed here

تم اچھا کرو زمانہ تم کو برا سمجھے یہ اس سے بہتر ہے کہ تم برا کرو اور زمانہ تم کو اچھا سمجھے

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**Question No: 16 ( Marks: 1 ) - Please choose one**

Which statement is true?

▶ **All words are strings** (Page 3)

- ▶ All strings are words
- ▶ Both are always same
- ▶ None of these

## MIDTERM EXAMINATION

Spring 2009

CS402- Theory of Automata (Session - 3)

**Question No: 1 ( Marks: 1 ) - Please choose one**

Alphabet  $S = \{a, bc, cc\}$  has \_\_\_\_\_ number of letters.

- ▶ One
- ▶ Two
- ▶ **Three** rep
- ▶ Four

**Question No: 2 ( Marks: 1 ) - Please choose one**

One language can be represented by more than one RE” this statement is \_\_\_\_\_

- ▶ False
- ▶ **True** (Page 9)
- ▶ Can't be assumed
- ▶ None of these

**Question No: 3 ( Marks: 1 ) - Please choose one**

$(a + b)^*b$  is RE for the language defined over  $S = \{a, b\}$  having words not ending in a

- ▶ **True** (Page 13)
- ▶ False
- ▶ Such a language is not regular
- ▶ None of these

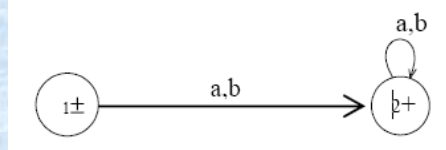
انسان کے لئے بری صحبت سے بڑھ کر بری کوئی چیز نہیں

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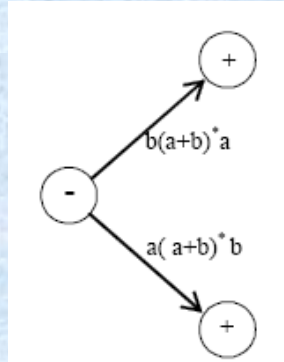
**Question No: 4 ( Marks: 1 ) - Please choose one**



Above given FA accepts \_\_\_\_\_ strings defined over  $S=\{a, b\}$

- ▶ **All (Page 15) rep**
- ▶ Some
- ▶ All but not null
- ▶ None of these

**Question No: 5 ( Marks: 1 ) - Please choose one**



Above given GTG accepts the language in which strings

- ▶ **Begins and ends with different letters (Page 24)**
- ▶ Begins and ends with same letters
- ▶ Have length greater than 1
- ▶ None of these

**Question No: 6 ( Marks: 1 ) - Please choose one**

According to 3rd part of the Kleene's theorem, If a language can be accepted by an RE then it can be accepted by a \_\_\_\_\_ as well

- ▶ TG
- ▶ FA
- ▶ **G and FA (Page 25)**
- ▶ None of these

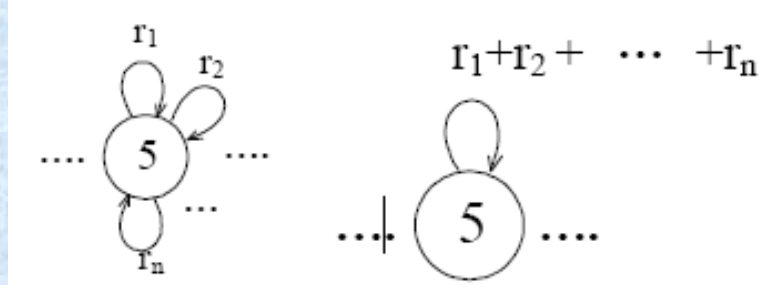
**Question No: 7 ( Marks: 1 ) - Please choose one**

If FA1 accepts no string and FA2 accepts many strings, then  $FA1 + FA2$  will be equal to

- ▶ FA1
- ▶ **FA2**
- ▶ May be both
- ▶ None of the given

خاموشی غصے کا بہترین علاج ہے

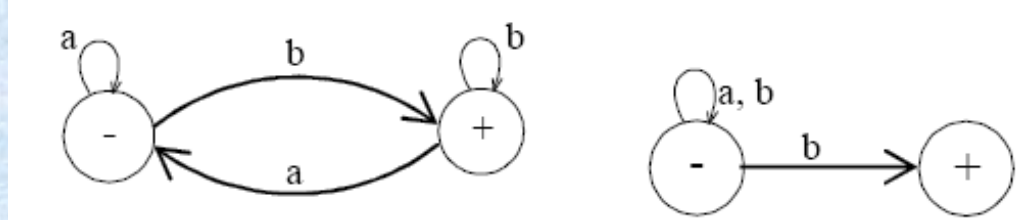
**Question No: 8 ( Marks: 1 ) - Please choose one**



Above given GTG's are \_\_\_\_\_

- ▶ **Equivalent (Page 27) rep**
- ▶ Non-equivalent
- ▶ Non-valid
- ▶ None of the given

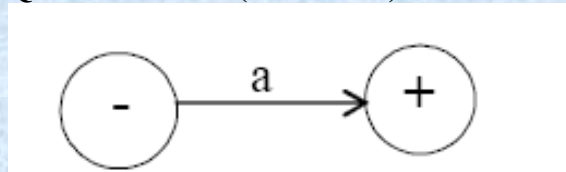
**Question No: 9 ( Marks: 1 ) - Please choose one**



Above given NFA and FA generate same language.

- ▶ **True (Page 41)**
- ▶ False
- ▶ FA & NFA can't be equivalent
- ▶ None of these

**Question No: 10 ( Marks: 1 ) - Please choose one**

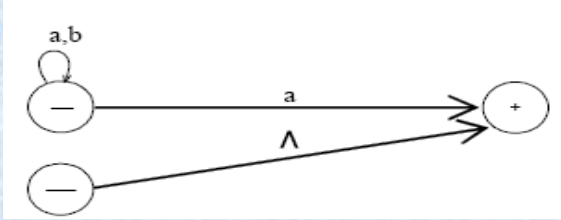


Above given structure is a \_\_\_\_\_

- ▶ FA
- ▶ TG
- ▶ **NFA (Page 44)**
- ▶ FA and NFA

افضل انسان وہ ہے جو اپنی اصلاح کی کوشش کرتا ہے

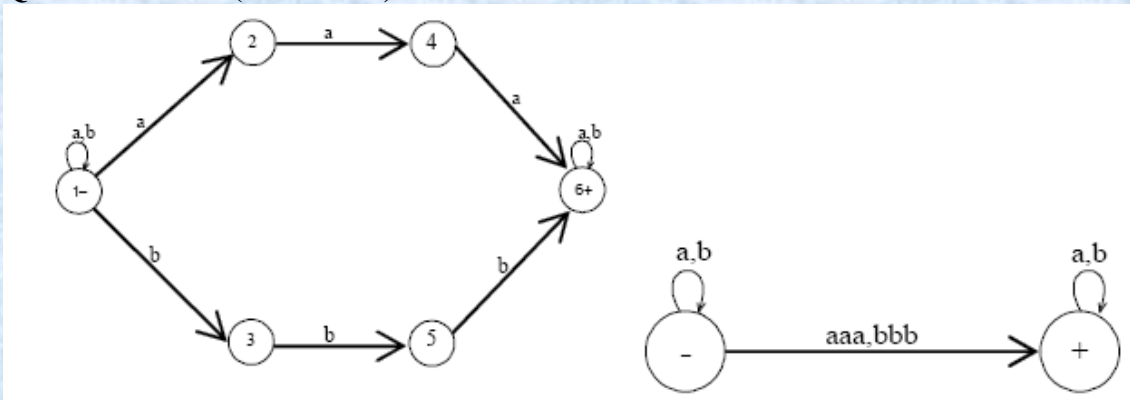
**Question No: 11 ( Marks: 1 ) - Please choose one**



Above given TG has the \_\_\_\_\_ RE.

- ▶  $(a + b)^*a$
- ▶  $\lambda + (a + b)^*a$  (Page 20)
- ▶ None of these
- ▶  $\lambda + (a + b)^*a^*$

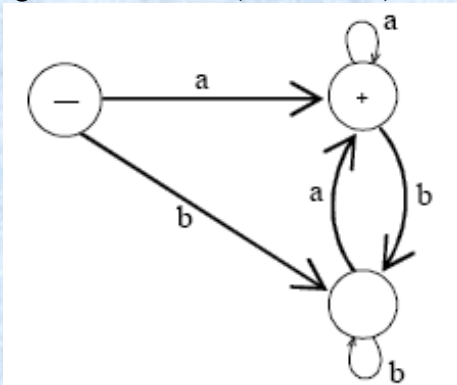
**Question No: 12 ( Marks: 1 ) - Please choose one**



Above given TG's are \_\_\_\_\_.

- ▶ **Equivalent** (Page 21)
- ▶ Non-equivalent
- ▶ TG's are not valid
- ▶ None of these

**Question No: 13 ( Marks: 1 ) - Please choose one**

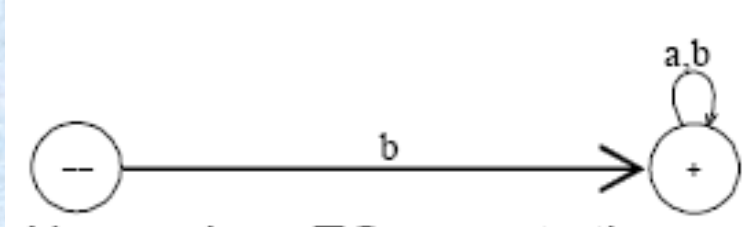




Above given FA has \_\_\_\_\_ RE.

- ▶  $(a + b)^*a$  (Page 13)
- ▶  $a(a + b)^*$
- ▶  $((a + b)^*a)^*$
- ▶  $(a + b)^*a$  &  $((a + b)^*a)^*$

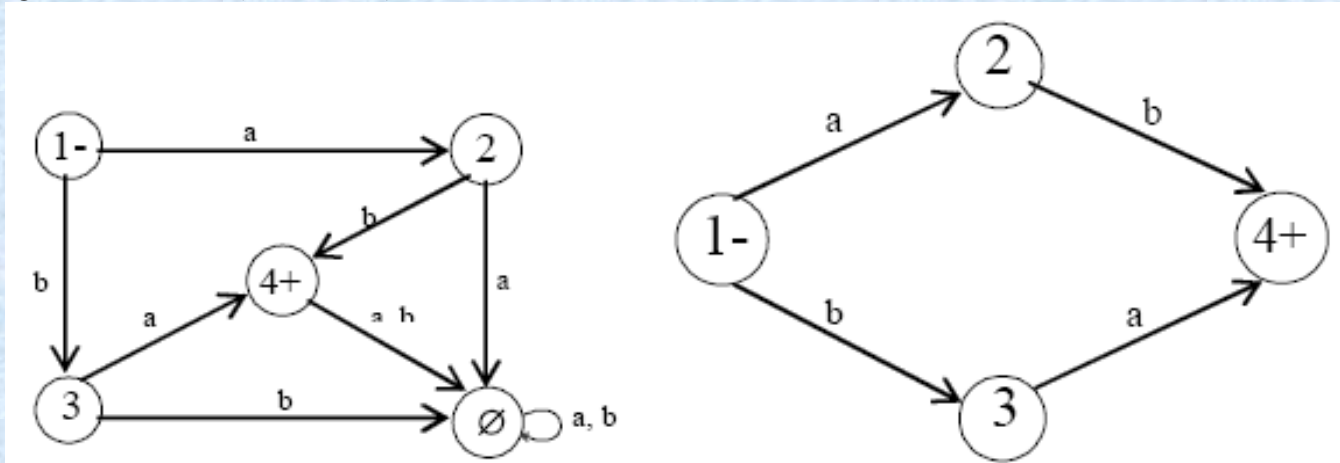
Question No: 14 ( Marks: 1 ) - Please choose one



Above given TG accepts the \_\_\_\_\_ string.

- ▶ bb
- ▶ baba
- ▶ bbba
- ▶ all of the given options (Page 19) rep

Question No: 15 ( Marks: 1 ) - Please choose one



Above given FA and NFA are equivalent. This statement is \_\_\_\_\_.

- ▶ True (Page 43) rep
- ▶ False
- ▶ FA & NFA can never be equivalent
- ▶ None of the given options

جھوٹ رزق کو کھا جاتا ہے

**MIDTERM EXAMINATION**  
Spring 2009  
CS402- Theory of Automata (Session - 3)

**Question No: 1 ( Marks: 1 ) - Please choose one**

If  $r_1$  and  $r_2$  are regular expressions then which of the following is not regular expression.

- ▶  $r_1 = r_2$
- ▶  $r_1 r_2$
- ▶  $r_1^*$
- ▶  $r_1 - r_2$  (Page 9)

**Question No: 2 ( Marks: 1 ) - Please choose one**

Which of the following is not a word of language EQUAL?

- ▶ aaabbb
- ▶ abbbabaa
- ▶ **abababa** (Page 5)
- ▶ bbbaaa

**Question No: 3 ( Marks: 1 ) - Please choose one**

If  $S = \{aa, bb\}$ , then  $S^*$  will not contain..

- ▶ aabbaa
- ▶ bbaabbbb
- ▶ **aaabbb**
- ▶ aabbbb

**Question No: 4 ( Marks: 1 ) - Please choose one**

One language can be represented by more than one RE" this statement is \_\_\_\_\_

- ▶ False
- ▶ **True** (Page 9) rep
- ▶ Can't be assumed
- ▶ None of these

**Question No: 5 ( Marks: 1 ) - Please choose one**

"Every Infinite language is regular" this statement is

- ▶ **True** (Page 11) rep
- ▶ False
- ▶ Can't be supposed
- ▶ None of these

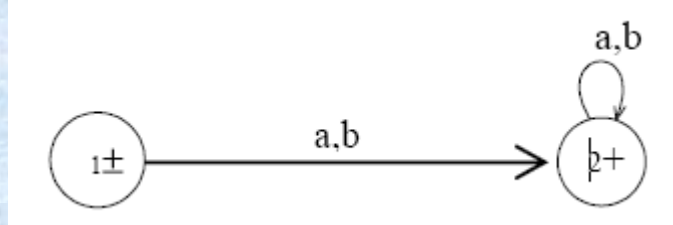
اطمینان قلب چاہتے ہو تو حسد سے دور رہو

**Question No: 6 ( Marks: 1 ) - Please choose one**

PALINDROME can be defined by more than one regular language

- ▶ True
- ▶ **False (Page 71)**
- ▶ By only one RE
- ▶ Some times By only one RE and Some times False

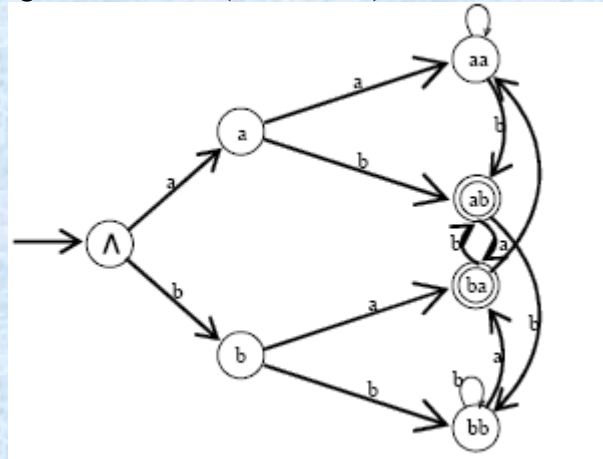
**Question No: 7 ( Marks: 1 ) - Please choose one**



Above given FA can be expressed as \_\_\_\_\_

- ▶  **$(a + b)^*$  (Page 19) rep**
- ▶  $a^* + b^*$
- ▶  $(ab + ba)^*$
- ▶ None of these

**Question No: 8 ( Marks: 1 ) - Please choose one**



Above given FA is drawn using

- ▶ **Tree structure (Page 18)**
- ▶ It is not an FA
- ▶ Graph structure
- ▶ None of these

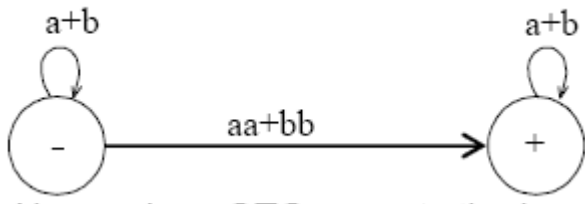
اس سے پہلے کہ تمہیں شہوت فتنے میں ڈالے نکاح کر لو

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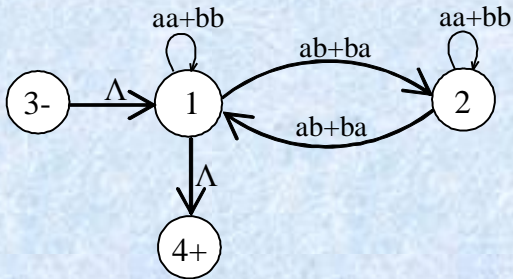
Question No: 9 ( Marks: 1 ) - Please choose one



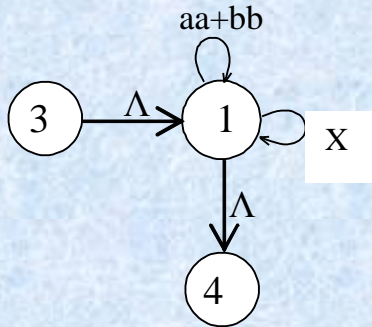
Above given GTG accepts the language in which strings

- ▶ Contains double a or double b (Page 24) rep
- ▶ Contains both a and double b
- ▶ Depends on the alphabet
- ▶ None of these

Question No: 10 ( Marks: 1 ) - Please choose one



If above given TG is drawn like

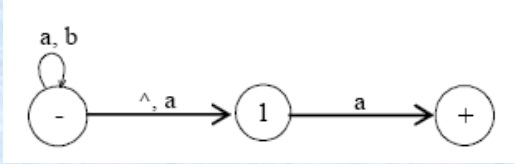


Then what will be written in place of X.

- ▶ (ab+ba)(aa+bb)(ba+ab)
- ▶ (ab+ba)(aa+bb)(ab+ba)
- ▶ (ab+ba)(aa+bb)\*(ab+ba) (Page 31) rep
- ▶ (ab+ba)(aa+bb)(ab+ba)\*

ہر چیز کی ایک پہچان ہوتی ہے اور عقلمند کی پہچان غور و فکر کرنا ہے اور غور و فکر کی پہچان خاموشی ہے

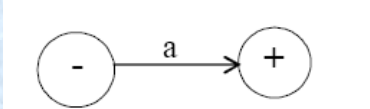
**Question No: 11 ( Marks: 1 ) - Please choose one**



Above given NFA- $\wedge$  accepts \_\_\_\_\_

- ▶ bab
- ▶ a
- ▶ aba
- ▶ **a & aba** rep

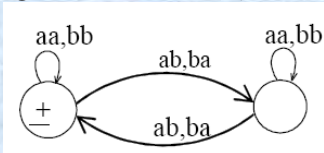
**Question No: 12 ( Marks: 1 ) - Please choose one**



Above given structure is a \_\_\_\_\_.

- ▶ FA
- ▶ TG
- ▶ FA & TG
- ▶ **NFA** (Page 44)

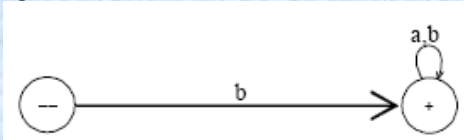
**Question No: 13 ( Marks: 1 ) - Please choose one**



Above given TG has \_\_\_\_\_ RE.

- ▶  $(aa+aa+(ab+ab)(aa+ab)^*(ab+ba))^*$
- ▶  **$(aa+bb+(ab+ba)(aa+bb)^*(ab+ba))^*$**  (Page 22)
- ▶  $(aa+bb+(ab+ba)(aa+bb)(ab+ba))^*$
- ▶ None of these

**Question No: 14 ( Marks: 1 ) - Please choose one**

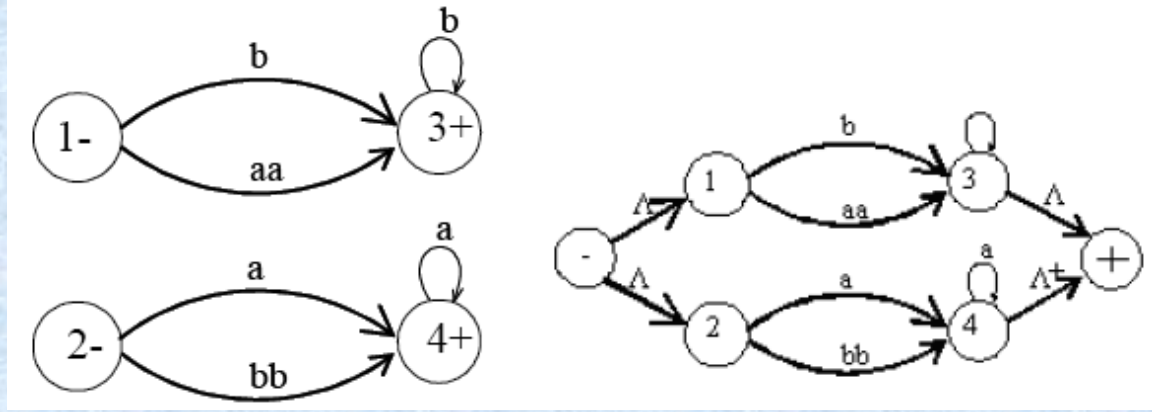


Above given TG has \_\_\_\_\_ RE.

- ▶  **$b(a + b)^*$**  (Page 19)
- ▶  $b^*(a + b)^*$
- ▶  $b^*(a + b)$
- ▶ None of these

لہنی مرضی اور اللہ کی مرضی میں فرق کا نام غم ہے

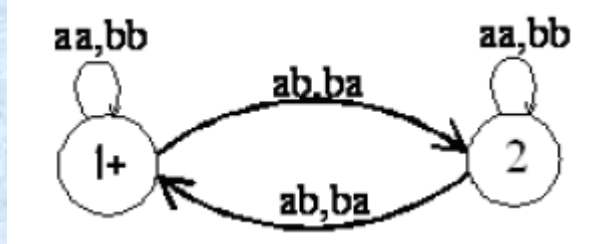
Question No: 15 ( Marks: 1 ) - Please choose one



Above given two TG's are \_\_\_\_\_.

- ▶ **Equivalent** (Page 26 - 27) rep
- ▶ None-equivalent
- ▶ Not valid
- ▶ None of the given

Question No: 16 ( Marks: 1 ) - Please choose one



Above given TG has \_\_\_\_\_ RE.

- ▶  $(aa+bb+(ab+ba)(aa+bb)(ab+ba))^*$
- ▶  **$(aa+bb+(ab+ba)(aa+bb)^*(ab+ba))^*$**  (Page 22) rep
- ▶  $(aa+ba+(bb+ba)(ab+bb)(ab+aa))^*$
- ▶  $(ab+ba+(ab+ba)(aa+bb)(ab+ba))^*$

وہ لوگ مبارک ہیں جو الفاظ سے نصیحت نہیں کرتے بلکہ عمل سے کرتے ہیں

**MIDTERM EXAMINATION**  
Spring 2009  
CS402- Theory of Automata (Session - 3)

**Question No: 1 ( Marks: 1 ) - Please choose one**

$S = \{baa, ab\}$ , then  $S^*$  will not contain

- ▶ **abbaab**
- ▶ abab
- ▶ baabaa
- ▶ abbaa

**Question No: 2 ( Marks: 1 ) - Please choose one**

$1^*(1 + \Lambda) = 1^*$  this statement is

- ▶ **True**                      **rep**
- ▶ False
- ▶ Sometimes true & sometimes false
- ▶ None of these

**Question No: 3 ( Marks: 1 ) - Please choose one**

One language can be represented by more than one RE” this statement is \_\_\_\_\_

- ▶ False
- ▶ **True**                      **(Page 9) rep**
- ▶ Can't be assumed
- ▶ None of these

**Question No: 4 ( Marks: 1 ) - Please choose one**

$a(a+b)^*a+b(a+b)^*b$  is RE for the language defined over  $S=\{a,b\}$  having words beginning and ending with same letters

- ▶ **True**                      **(Page 14)**
- ▶ False
- ▶ Such a language is not regular
- ▶ None of these

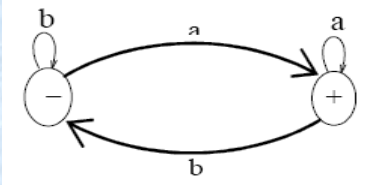
**Question No: 5 ( Marks: 1 ) - Please choose one**

If a language has RE, then that language can be expressed through TG.

- ▶ **True**                      **(Page 25) rep**
- ▶ False
- ▶ Depends on language
- ▶ None of these

**کامیاب و کامران زندگی یہی ہے کہ جہاں رہو جس حال میں رہو خوش رہو**

**Question No: 6 ( Marks: 1 ) - Please choose one**



Above given FA can be expressed by

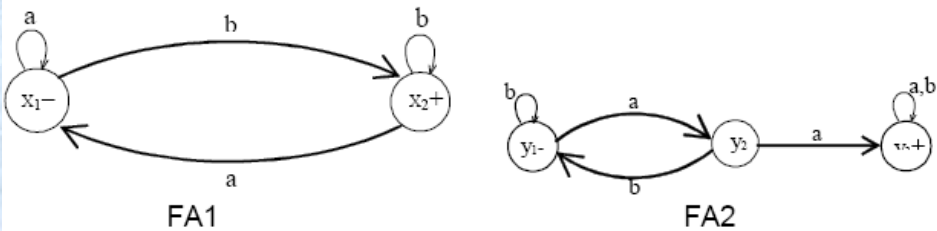
- ▶  **$(a + b)^*a$**  (Page 14)
- ▶  $(a + b)^*b$
- ▶  $a(a + b)^*$
- ▶  $b(a + b)^*$

**Question No: 7 ( Marks: 1 ) Please choose one**

In TG there may exist no paths for certain string.

- ▶ **True** (Page 25) rep
- ▶ False
- ▶ Depends on the language
- ▶ None of these

**Question No: 8 ( Marks: 1 ) - Please choose one**



FA3 will express  $r_1r_2$ . then F3 will have \_\_\_\_\_ number of states in its diagram.

- ▶ 8
- ▶ 7
- ▶ **6** (Page 36)
- ▶ 5

**Question No: 9 ( Marks: 1 ) - Please choose one**

FA1 corresponds to  $r^*$ , then FA1 must accept \_\_\_\_\_ string.

- ▶ **Every** (Page 07)
- ▶ Null
- ▶ Odd length
- ▶ Even length

اچھائی کرنے کے لئے ہمیشہ کسی بہانے کی تلاش میں رہو

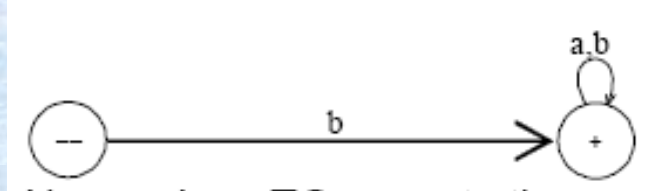


**Question No: 10 ( Marks: 1 ) - Please choose one**

In NFA, there may be more than one transition for certain letters and there may not be any transition for certain letters. This statement is \_\_\_\_\_.

- ▶ False
- ▶ **True (Page 40)**
- ▶ Depends on language
- ▶ None of the given

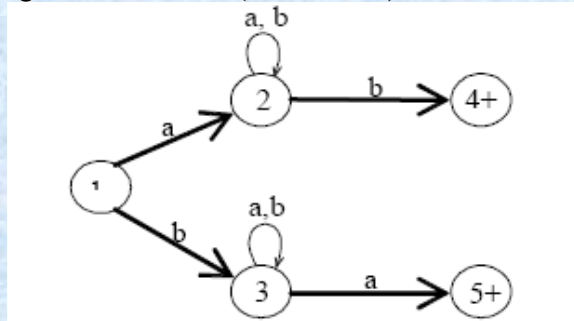
**Question No: 11 ( Marks: 1 ) - Please choose one**



Above given TG accepts the language in which all strings

- ▶ Ends in b
- ▶ **Begins with b (Page 19)**
- ▶ Ends and begins with b
- ▶ None of the given

**Question No: 12 ( Marks: 1 ) - Please choose one**



Above given TG represents the language\_\_\_\_\_

- ▶ Begins and ends with same letters
- ▶ **Begins and ends with different letters (Page 21) rep**
- ▶ Begins with a
- ▶ None of these

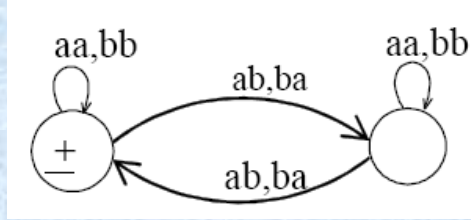
اطمینان قلب چاہتے ہو تو حسد سے دور رہو

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**Question No: 13 ( Marks: 1 ) - Please choose one**



Above given TG represents the language i.e.

- ▶ **EVEN-EVEN** (Page 22)
- ▶ PALINDROME
- ▶ FACTORIAL
- ▶ None of these

**Question No: 14 ( Marks: 1 ) - Please choose one**

FA1 and FA2 are two FA's representing two languages. Then FA3, which is sum of FA1 and FA2, will accept the strings which are

- ▶ Accepted by FA1 AND FA2
- ▶ Accepted by FA1 OR FA2
- ▶ **Accepted by FA1 AND/OR FA2** (Page 32)
- ▶ None of the given options

Ref:- language corresponding to  $r_1 + r_2$  is the union of corresponding languages L1 and L2, consists of the strings belonging to L1 or L2 or both

**Question No: 15 ( Marks: 1 ) - Please choose one**

$a(a+b)^*$  is the RE of language defined over  $S = \{a, b\}$  having at least one a

- ▶ **True**
- ▶ False
- ▶ Such a language does not exist
- ▶ None of the given options

**Question No: 16 ( Marks: 1 ) - Please choose one**

$(a+b)^*a$  is RE for the language defined over  $S = \{a, b\}$  having words not ending in b

- ▶ **True**
- ▶ False
- ▶ Such a language is not regular
- ▶ None of the given options

بہادر آدمی ایک مرتبہ جبکہ بزدل آدمی کئی مرتبہ مرتا ہے

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**MIDTERM EXAMINATION**  
Spring 2009  
CS402- Theory of Automata (Session - 1)

**Question No: 1 ( Marks: 1 ) - Please choose one**

Alphabet  $S = \{a, bc, cc\}$  has \_\_\_\_\_ number of letters.

- ▶ One
- ▶ Two
- ▶ **Three**      **rep**
- ▶ Four

**Question No: 2 ( Marks: 1 ) - Please choose one**

In which of the following language  $Rev(s)=s$

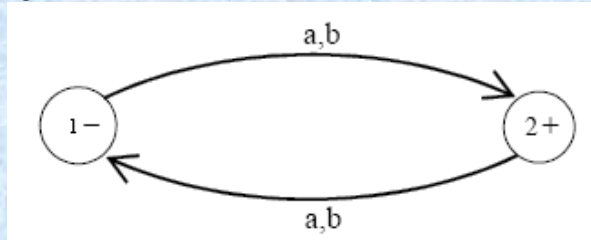
- ▶ EQUAL
- ▶ INTEGER
- ▶ **PALINDROME**      **(Page 6)**
- ▶ FACTORIAL

**Question No: 3 ( Marks: 1 ) - Please choose one**

If  $S = \{ab, bb\}$ , then  $S^*$  will not contain

- ▶ abbbab
- ▶ **bbba**
- ▶ bbbbab
- ▶ ababbb

**Question No: 4 ( Marks: 1 ) - Please choose one**

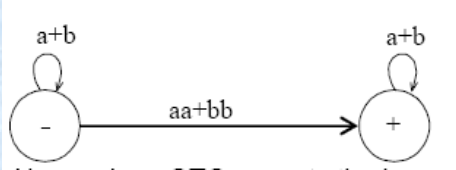


Above given FA generates the language having strings of \_\_\_\_\_

- ▶ **ODD length**
- ▶ EVEN length
- ▶ Equal number of a's and b's
- ▶ None of these

پہلے وقتوں میں تعلیم کم تھی اور علم زیادہ، آج کل علم کم ہے اور تعلیم زیادہ

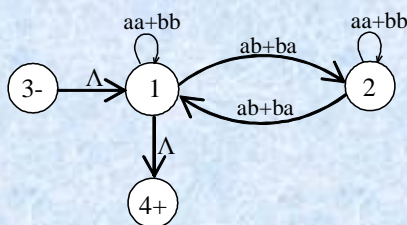
**Question No: 5 ( Marks: 1 ) - Please choose one**



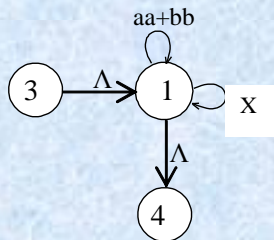
Above given GTG accepts the language in which strings

- ▶ **Contains double a or double b (Page 24) rep**
- ▶ Contains both a and double b
- ▶ Depends on the alphabet
- ▶ None of these

**Question No: 6 ( Marks: 1 ) - Please choose one**



If above given TG is drawn like



Then what will be written in place of X.

- ▶  $(ab+ba)(aa+bb)(ba+ab)$
- ▶  $(ab+ba)(aa+bb)(ab+ba)$
- ▶  **$(ab+ba)(aa+bb)^*(ab+ba)$  (Page 31) rep**
- ▶  $(ab+ba)(aa+bb)(ab+ba)^*$

**Question No: 7 ( Marks: 1 ) - Please choose one**

FA3 expresses  $r_1r_2$ . Then initial state of FA3 will consist of

- ▶ Initial state of FA2
- ▶ **Initial state of FA1 (Page 35)**
- ▶ Initial states of both FA1 & FA2
- ▶ Depends on FA's

ہر کسی کی روٹی نہ کھا بلکہ ہر شخص کو اپنی روٹی کھلا

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**Question No: 8 ( Marks: 1 ) - Please choose one**

FA3 expresses  $r_1r_2$ . Then there will be at least one final state of FA3 that consist of final state of FA1 and initial state of FA2.

- ▶ True
- ▶ **False (Page 35)**
- ▶ Depends on language
- ▶ None of these

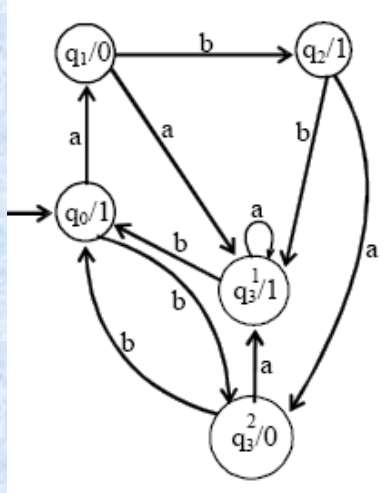
**Question No: 9 ( Marks: 1 ) - Please choose one**

Two machines are said to be equivalent if they print the same output string when the different input string is run on them

- ▶ True
- ▶ **False (Page 60)**
- ▶ Depends on language
- ▶ May be or may not be

**Question No: 10 ( Marks: 1 ) - Please choose one**

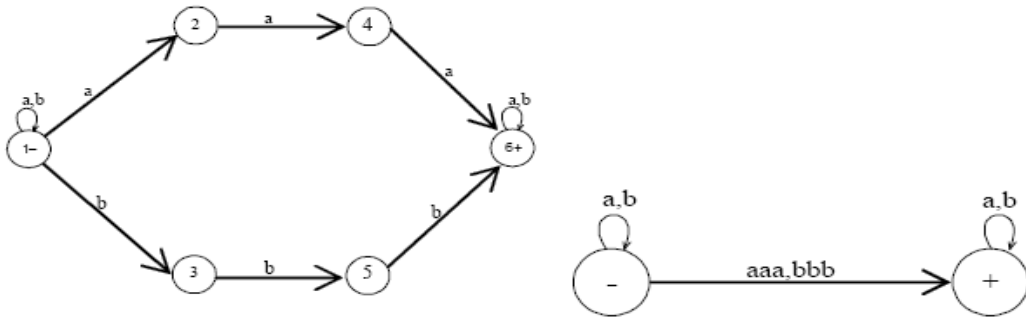
Running the string abbabbba on this Moore machine. The outputs will be \_\_\_\_\_



- ▶ **101111010 (Page 62)**
- ▶ 01111010
- ▶ 01011110
- ▶ 01010101

فرقہ بندی ہی ہماری قوم کا زوال کا باعث ہے

**Question No: 11 ( Marks: 1 ) - Please choose one**



Above given TG's are \_\_\_\_\_.

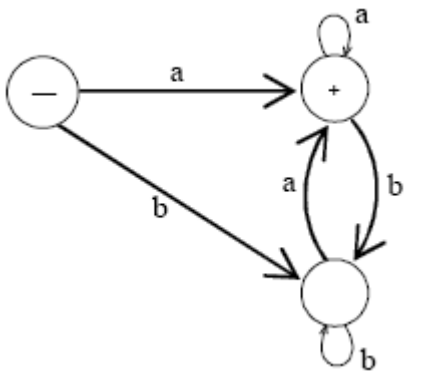
- ▶ None of these
- ▶ **Equivalent (Page 21) rep**
- ▶ Non-equivalent
- ▶ TG's are not valid

**Question No: 12 ( Marks: 1 ) - Please choose one**

TG can have more than one initial state.

- ▶ **True (Page 18)**
- ▶ False
- ▶ Depends on alphabets
- ▶ None of these

**Question No: 13 ( Marks: 1 ) - Please choose one**



Above given FA accepts null string.

- ▶ True
- ▶ **False**
- ▶ FA is not valid
- ▶ None of these

روح کی گہرائیوں کو پیش نظر رکھ کر بے غرض دوستی اختیار کرو

**Question No: 14 ( Marks: 1 ) - Please choose one**

If in an NFA,  $\wedge$  is allowed to be a label of an edge then that NFA is called \_\_\_\_\_.

- ▶ Will not remain NFA
- ▶ NFA with
- ▶ **NFA with null string (Page 42) rep**
- ▶ Either "NFA with null string" OR "NFA with "

**Question No: 15 ( Marks: 1 ) - Please choose one**

One FA has n states and m letters in the alphabet. Then FA will have \_\_\_\_\_ number of transitions in the diagram.

- ▶ (n)+(m)
- ▶ **(m)(n) OR (n)(m) rep**
- ▶ None of the given options
- ▶ (m)-(n)

**Question No: 16 ( Marks: 1 ) - Please choose one**

$(a+b)^*a(a+b)^*b(a+b)^*$  is the RE of language defined over  $S=\{a,b\}$  having at least one a and one b

- ▶ **True**
- ▶ False
- ▶ Such a language does not exist
- ▶ None of the given options

کتنا شریف ہے وہ غمزدہ دل جو سب کو خوش کرنے کی کوشش کرتا ہے  
دنیا حقیر نظر آتی ہے، جب غم یا خوشی کی انتہاء ہو جائے  
بے حسنی نصف موت ہے

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