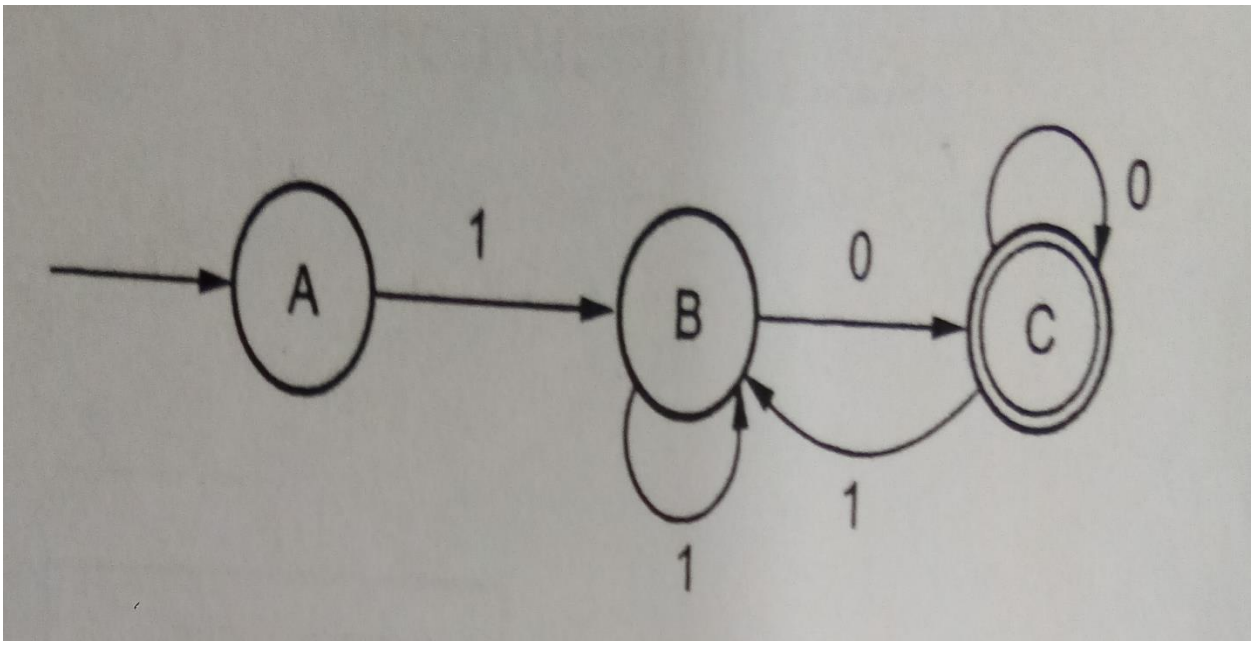
Vidyavardhini's College of Engineering & Technology, Vasai

Department of Computer Engineering

Academic Year 2020-21

Semester	**V(CBCGS)**	**Class**	**TE**
Course Code	**CSC504**	**Course**	**Theory of Computer Science**

Q.1 Figure shows finite automata which accepts only those strings _____



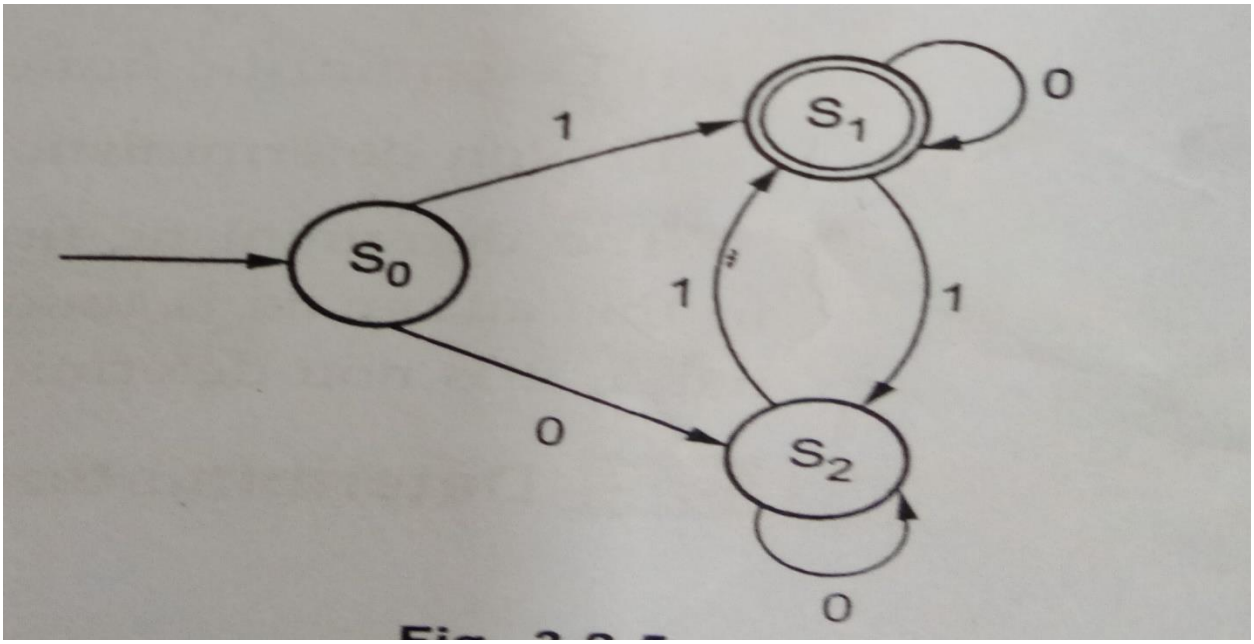
A) which start with 1 and ends with 0

B) which contains only input 101

C) which start with 1 and ends with 1

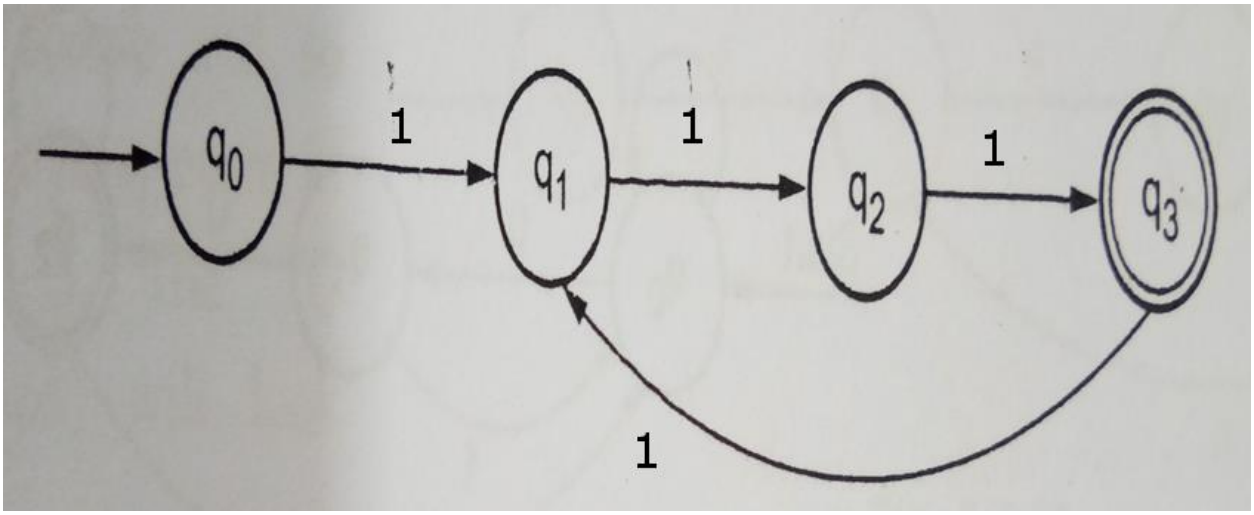
D) which start with Ɛ and ends with 1

Q.2 Figure shows finite automata which accepts _____



A) **odd number of 1's and any number of 0's.**
B) **odd number of 0's and any number of 1's.**
C) **even number of 1's and any number of 0's.**
D) **odd number of 0's and even number of 1's.**

Q.3 Figure shows finite automata which checks _____

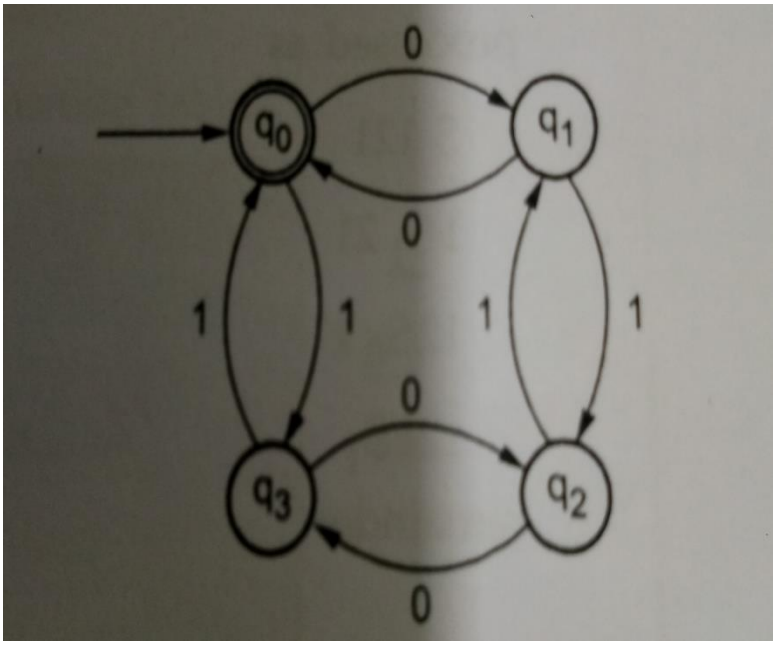


A) **whether the given unary number is divisible by 3**
B) **whether the given unary number is divisible by 2**

C) **whether the given unary number is divisible by 4**

D) **whether the given unary number is divisible by 0**

Q.4 Figure shows finite automata which accepts _____



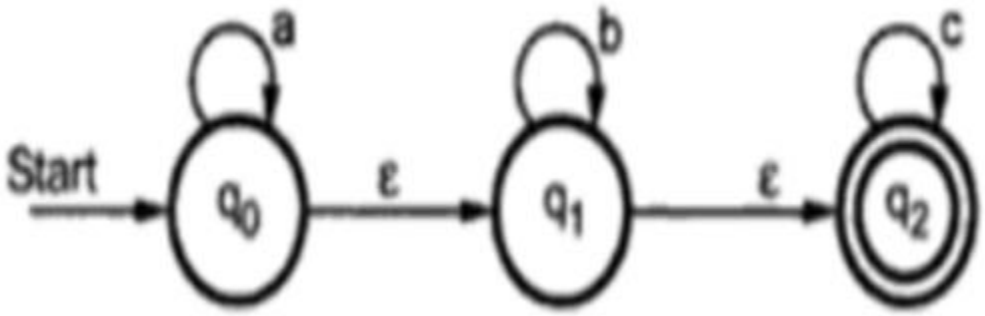
A) **Even number of 0's and even number of 1's**

B)Odd number of 0's and even number of 1's

C)Odd number of 0's and odd number of 1's

D)Even number of 0's and odd number of 1's

Q.5 Following NFA with Ɛ represents language consisting_____



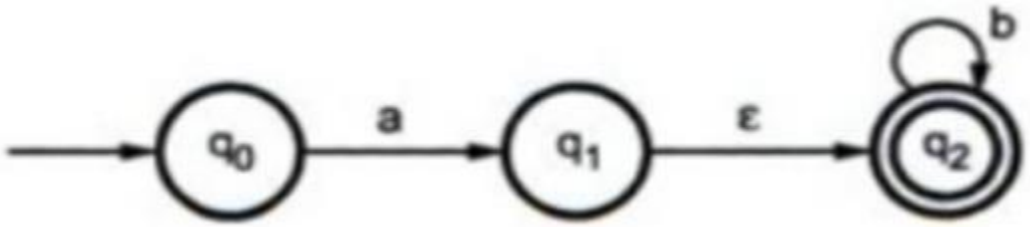
A) **The strings of any number of a's followed by any number of b's followed by any number of c's**

B) The strings of any number of a's followed by any number of Ɛ, followed by any number of c's

C) The strings of any number of a's followed by any number of b's followed by any number of Ɛ

D) The strings of any number of Ɛ followed by any number of b's followed by any number of c's

Q.6 Ɛ-closures of q_0,q_1 and q_2 are obtained as_____for following NFA with Ɛ



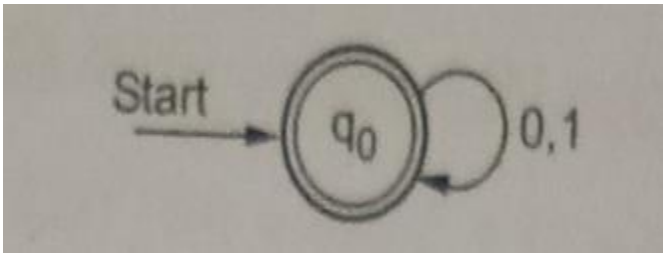
A)Ɛ-closure(q_0)={ q_0}, Ɛ-closure(q_1)={ q_1, q_2}, Ɛ-closure(q_2)={q_2}

B) Ɛ-closure(q_0)={ q_0, q_1}, Ɛ-closure(q_1)={ q_1, q_2}, Ɛ-closure(q_2)={q_2}

C) Ɛ-closure(q_0)={ q_0, q_1}, Ɛ-closure(q_1)={ q_1}, Ɛ-closure(q_2)={q_2}

D) Ɛ-closure(q_0)={ q_0}, Ɛ-closure(q_1)={ q_1}, Ɛ-closure(q_2)={q_2}

Q.7 Following DFA represents Language_____



A)Containing any combination of 0 and 1

B) Containing equal number of zeros and 1's
C) Containing all the string except Ɛ
D) Containing odd number of 0's and 1's

8) Regular expression =0(00)* represents the language_____

A)having odd number of 0's
B) having even number of 0's
C) having equal number of 0's
D) having any number of 0's as well as empty string

9)_____is the regular expression to denote the language L over the set ∑={a,b,c} such that every string will have atleast one a followed by atleast one b followed by atleast one c

A) $a^+ b^+ c^+$

B) $a^* b^* c^*$

C) $a^* b^* c$

D) $ab^* c^*$

10) _____is R.E. for the language L which accepts all the strings with atleast two b's over the set ∑={a,b}

A) (a+b)* b (a+b)* b (a+b)*

B) (a+b)* (a+b)* (a+b)*

C) $(a+b)^+ (a+b)^*(a+b)^+$
D) (a+b) (a+b) (a+b)*

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11) Production rules for the CFG for the language having any number of a's over the set ∑={a}

A) S → aS and S → Ɛ
B) **)** S → aS
C) S → a
D) S → S

12) The rule for_____is Non terminal=one terminal.Any number of non-terminals

A)GNF

B)CNF

C)Simplified grammer

D)LBA

13) In_____we can remove epsilon production, unit production and useless symbol without changing the meaning.

A)Finite Automata

B)Context free grammer

C)Turing machine

D)Linear bounded automata

14) The grammar S → (S) | SS | ϵ is not suitable for predictive parsing because the grammar is

A) Right recursive

B) Left recursive
C) Ambiguous
D) An operator grammar

15) Consider the following two Grammars:

G1 : S → SbS | a
G2 : S → aB | ab, A→GAB | a, B→ABb | b

Which of the following option is correct?

A) Only G1 is ambiguous

B) Only G2 is ambiguous

C) Both G1 and G2 are ambiguous

D) Both G1 and G2 are not ambiguous

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16) _____is the instantaneous description to design PDA for accepting language $L=a^nb^{2n} \mid n\geq 1$

A)$\delta(q_0,a,Z_0) = (q_0,aaZ_0)$

$\delta(q_0,a,a) = (q_0,aaa)$

$\delta(q_0,b,a) = (q_1,\varepsilon)$

$\delta(q_1,b,a) = (q_1,\varepsilon)$

$\delta(q_1,\varepsilon,Z_0) = (q_2,\varepsilon)$

B) $\delta(q_0,a,Z_0) = (q_0,aZ_0)$

$\delta(q_0,a,a) = (q_0,a)$

$\delta(q_0,b,a) = (q_1,ba)$

$\delta(q_1,b,a) = (q_1,ab)$

$\delta(q_1,\varepsilon,Z_0) = (q_2,\varepsilon)$

C) $\delta(q_0,a,Z_0) = (q_0,a)$

$\delta(q_0,a,a) = (q_0,aa)$

$\delta(q_0,b,a) = (q_1,b)$

$\delta(q_1,b,a) = (q_1,a)$

$\delta(q_1,\varepsilon,Z_0) = (q_1, Z_0)$

D) $\delta(q_0,a,Z_0) = (q_0,a)$

$\delta(q_0,a,a) = (q_0,aa)$

$\delta(q_0,b,a) = (q_1,ab)$

$\delta(q_1,b,a) = (q_1,ab)$

$\delta(q_1,\varepsilon,Z_0) = (q_1, Z_0)$

Q17) $L=0^m1^n0^{m+n}$ can be constructed by using _____
A)DFA
B)NFA
C) PDA
D)Moore

Q.18)The stack structure is used in_____

A) DFA

B) Push down automata

C) NFA

D) mealy machine

Q.19 _____is a multitrack turing machine which has only one tape and this tape is exactly of same length as that of input

A)LBA

B)PDA

C)Turing machine

D)Context sensitivity grammer

Q.20 Logic to construct turing machine for the language $L=a^nb^n$ where $n\geq1$ is _____

A)Convert a by A and then move ahead along the input tape and find out the b convert it to B. Repeat this process for all a's and b's

B) Convert b by B and then move ahead along the input tape and find out the a convert it to A.

C) Convert a by A and then move ahead along the input tape and find out the b convert it to B.

D) Convert all a's by A first and then convert all b's to B.

Q.21 In the high level languages use of _____ built the modularity in the program development process
A)Subroutines
B)Function
C)stack
D)code

Q.22 The universal language is a set of _____ strings which can be modeled by a turing machine

A)Binary

B)decimal

C)Hexadecimal

D)octal

Q.23 **Logic to construct TM for the addition function for the unary number system is** _____

- **A) To simply replace + by 1 and move ahead right for searching end of the string and then we will convert last 1 to Δ.**
- **B) To move ahead right for searching end of the string and then we will convert last 1 to Δ.**
- **C) To simply replace + by 1 and move ahead right for searching end of the string Δ.**
- **D) To move ahead right for searching end of the string.**

Q.24 Which of the following problems is undecidable?

A) To determine if two finite automata are equivalent
B) Membership problem for context free grammar
C) Finiteness problem for finite automata
D) Ambiguity problem for context free grammar

Q.25) The undecidability of strings is determined with the help of _____

A)Post correspondence theorem

B)Rice theorem

C)halting

D)pre-correspondence theorem