UNIT I- PART A

1. A regular language over an alphabet ∑ is one that cannot be obtained from the basic languages using the operation

   a) Union

   b) Concatenation

   c) Kleene*

   d) All of the mentioned

2. The number of elements in the set for the Language L={xϵ(∑r) *|length if x is at most 2} and ∑={0,1} is_____

   a) 7

   b) 6

   c) 8

   d) 5

3. Given: ∑= {a, b} L= {xϵ∑*|x is a string combination} ∑4 represents which among the following

   a){aa, ab, ba, bb}

   b) {aaaa, abab, ε, abaa, aabb}

   c) {aaa, aab, aba, bbb}

   d) {**ε**}

4. Mealy and Moore machine can be categorized as:

   a) Inducers

   b) Transducers

   c) Turing Machines

   d) Linearly Bounder Automata

5. A Language for which no DFA exist is a_____

   a) Regular Language

   b) Non-Regular Language

   c) May be Regular

   d) Cannot be said

6. Which of the following is not an example of finite state machine system?

   a) Control Mechanism of an elevator

b) Combinational Locks

c) Traffic Lights

d) Digital Watches

7. Numbers of states require to accept string ends with 10.

   a) 3

   b) 2

   c) 1

   d) 0

8. L1= {w | w does not contain the string tr }

   L2= {w | w does contain the string tr}

   Given ∑= {t, r}, The difference of the minimum number of states required to form L1 and L2?

   a) 0

   b) 1

   c) 2

   d) Infinite

9. The total number of states to build the given language using DFA:

   L= {w | w has exactly 2 a's and at least 2 b's}

   a) 10

   b) 11

   c) 12

   d) 13

10. Given Language: {x | it is divisible by 3}

    The total number of final states to be assumed in order to pass the number constituting {0, 1} is

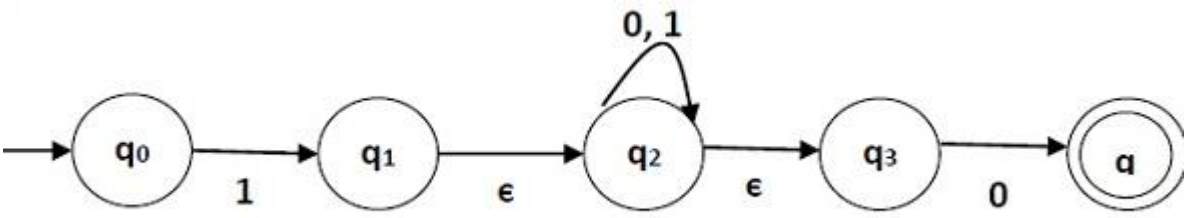
    a) 0

    b) 1

    c) 2

    d) 3

11. Which of the following is same as the given DFA?



a) (0+1)*001(0+1)*

b) 1*001(0+1)*

c) (01)*(0+0+1)(01)*

d) 1(0+1)*0

12. Which among the following cannot be accepted by a regular grammar?

a) L is a set of numbers divisible by 2

b) L is a set of binary complement

c) L is a set of string with odd number of 0

d) **L is a set of 0^n1^n**

13. Consider the languages L1 = φ and L2 = {1}. Which one of the following represents $L^*_1 \cup L^*_1 L^*_2$?

(A) {∈}

(B) {∈, 1}

(C) φ

(D) 1*

14. The non- Kleene Star operation accepts the following string of finite length over set A = {0,1} | where string s contains even number of 0 and 1

a) 01,0011,010101

b) 0011,11001100

c) ε,0011,11001100

d) ε,0011,11001100

15. Transition function maps.

a) Σ * Q -> Σ

b) Q * Q -> Σ

c) Σ * Σ -> Q

d) Q * Σ -> Q

16. δ*(q,ya) is equivalent to .

a) δ((q,y),a)

b) δ(δ*(q,y),a)

c) δ(q,ya)

d) independent from δ notation

17. If we select a string w such that w∈L, and w=xyz. Which of the following portions cannot be an empty string?

a) x

b) y

c) z

d) xz

18. Fill in the blank in terms of p, where p is the maximum string length in L.

Statement: Finite languages trivially satisfy the pumping lemma by having n = _____

a) p*1

b) p+1

c) p-1

d) p

19. Predict the analogous operation for the given language:

A: {[p, q] | p ϵ A1, q does not belong to A2}

a) A1-A2

b) A2-A1

c) A1.A2

d) A1+A2

20. e-transitions are

a) conditional

b) unconditional

c) input dependent

d) independent

21. RR* can be expressed in which of the forms:

a) R+

b) R-

c) R+ U R-

d) R

22. Simplify the following regular expression:

ε+1*(011) *(1*(011) *) *

a) (1+011) *

b) (1*(011) *)

c) (1+(011) *) *

d) (1011) *

23. Precedence of regular expression in decreasing order is

a) * , . , +

b) . , * , +

c) . , + , *

d) + , a , *

24. L and ~L are recursive enumerable then L is

a) Regular

b) Context free

c) Context sensitive

d) Recursive

25. Which of the following statements is false?

(A) Every NFA can be converted to an equivalent DFA

(B) Every non-deterministic Turing machine can be converted to an equivalent deterministic Turing machine

(C) Every regular language is also a context-free language

(D) **Every subset of a recursively enumerable set is recursive**