

Theory of Computation MCQs [set-1]

Chapter: *more mcqs*

1. What is the reason behind a Turing machine is more powerful than finite state machine FSM?

- A. turing machine head movement is continued to one direction.
- B. turing machine head moment is in both directions i.e. left moment and right moment as well.
- C. turing machine has capability remember arbitrary long sequence of input string.
- D. all are correct.

Answer: C

2. A pushdown automata behaves like a Turing machine, when it has number of auxiliary/ memory.

- A. 0
- B. exactly 2
- C. 2 or more
- D. both exactly 2 or more are correct

Answer: C

3. The language $L = \{a^n b^n a^n \mid n \geq 1\}$ is recognized by

- A. turing machine
- B. 2 pushdown automata
- C. post machine
- D. all are correct

Answer: D

4. If Turing machine accepts all the words of the languages L and rejects

or loops for other words, which are not in L, then L is said to be

- A. recursive enumerable
- B. recursive
- C. context free language (cfl)
- D. none of them

Answer: A

5. If a Turing machine halts for each and every word of a language L and rejects other, then L is said to be

- A. recursive enumerable
- B. recursive
- C. context free language
- D. none of these

Answer: C

6. Universal Turing machine (UTM) influenced the concepts of

- A. computability
- B. interpretive implementation of programming language
- C. program and data is in same memory
- D. all are correct

Answer: D

7. The number of symbols necessary to simulate a Turing machine with m symbols and n states

- A. $4m \times n + m$
- B. $4m \times n + n$
- C. $m+n$
- D. none of them

Answer: A

8. A universal Turing machine is a

- A. reprogrammable Turing machine
- B. two-tape Turing machine
- C. single tape Turing machine
- D. none of them

Answer: A

9. The difference between a read-only Turing machine and a two-way finite state machine is

- A. head movement
- B. finite control
- C. storage capacity
- D. power

Answer: C

10. Which is correct regarding an off-line Turing machine?

- A. an offline Turing machine is a special type of multi-tape Turing machine
- B. an offline Turing machine is a kind of multi-tracks Turing machine
- C. an offline Turing machine is a kind of single-track Turing machine
- D. none of them

Answer: A

11. Which of the following statement is wrong?

- A. power of NTM and TM is same
- B. for $n \geq 2$, NPDA has some power as a TM
- C. for $n \geq 2$, NPDA and 2PDA have same power
- D. power of NTM and TM is not same

Answer: D

12. Four pairs are following; in each pair both objects have some common thing. Choose the odd pair;

- A. (tm, 2pda)
- B. (computer, utm)
- C. (2pda, npda)
- D. (fa, pda)

Answer: D

13. We think of a Turing machine's transition function as a

- A. computer system
- B. software
- C. hardware
- D. all of them

Answer: B

14. Church's Thesis supports

- A. a turing machine as a general-purpose computer system
- B. a turing machine an algorithm and an algorithm as a turing machine
- C. both tm is an general-purpose computer and tm is an algorithm and vice-versa are correct
- D. none of them is correct

Answer: C

15. A random access machine (RAM) and truing machine are different in

- A. power
- B. accessing
- C. storage
- D. both accessing and storage are correct

Answer: D

16. Choose the correct statement

- A. recursive set ? recursive enumerable set
- B. total function is same as partial function
- C. recursive sets are analogous to total functions
- D. both recursive set ? recursive enumerable set and recursive sets are analogous to total functions are correct.

Answer: D

17. Given $S = \{a, b\}$, which one of the following sets is not countable?

- A. the set all strings over ?
- B. the set of all language over ?
- C. the set of all binary strings
- D. the set of all languages over ? accepted by turing machines

Answer: B

18. In which of the stated below is the following statement true? "For every non-deterministic machine M1, there exists as equivalent deterministic machine M2 recognizing the same language."

- A. m1 is a non-deterministic finite automata
- B. m1 is a non-deterministic push-down automata
- C. m1 is a non-deterministic turing machine
- D. for no machine m1 use the above statement true

Answer: C

19. Which of the following conversion is not possible (algorithmically)?

- A. regular grammar to context-free grammar
- B. non-deterministic finite state automata to deterministic finite state automata

- C. non-deterministic pushdown automata to deterministic pushdown automata
- D. none deterministic turing machine to deterministic turing machine

Answer: B

Chapter: *Unit 1*

20. $L_1 = \{ w \mid w \text{ has at least as many occurrences of } (110)\text{'s as } (011)\text{'s} \}$. Let $L_2 = \{ w \mid w \text{ has at least as many occurrence of } (000)\text{'s as } (111)\text{'s} \}$. Which one of the following is TRUE?

- A. L_1 is regular but not L_2
- B. L_2 is regular but not L_1
- C. Both L_1 and L_2 are regular
- D. Neither L_1 nor L_2 are regular

Answer: B

21. A spanning tree for a simple graph of order 24 has

- A. 12 edges
- B. 6 edges
- C. 23 edges
- D. None of above.

Answer: C

22. If G is a simple connected 3-regular planar graph where every region is bounded by exactly 3 edges, then the edges of G is

- A. 3
- B. 4
- C. 6
- D. 5

Answer: C

23. If G is a connected planar graph of v vertices e edges and r regions then

- A. $v-e+r=2$
- B. $e-v+r=2$
- C. $v+e-r=2$
- D. None of above.

Answer: A

24. A Hamiltonian cycle in a Hamiltonian graph of order 24 has

- A. 12 edges.
- B. 24 edges
- C. 23 edges
- D. None of above.

Answer: B

25. If G is a simple connected 3-regular planar graph where every region is bounded by exactly 3 edges, then the edges of G is

- A. 3
- B. 4
- C. 6
- D. 5

Answer: C

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