MST-3 Theory of Computation - Sem V

No extra time will be given. Choose the MOST suitable answer

1. Statement 1: Mealy machine reacts faster to inputs.
   Statement 2: Moore machine has more circuit delays.
   Choose the correct option:

   - Statement 1 is true and Statement 2 is true
   - Statement 1 is true but Statement 2 is false
   - Statement 1 is false and Statement 2 is true
   - None of the mentioned is true

2. A language is represented by a regular expression (a)*(a + ba). Which of the following string does not belong to the regular set represented by the above expression?

   - ababa
   - aba
   - aa
   - aaa

3. The concept of FSA is much used in this part of the compiler

- Lexical analysis
- Parser
- Code generation
- Code optimization

4. R1 and R2 are regular sets. Which of the following is not true?

- R1 n R2 need not be regular
- S* – R1 is regular
- R1 ? R2 is regular
- Is regular

5. Which of the following statement is wrong?

- All non-regular languages can be generated by CFGs
- Some non-regular languages cannot be generated by any CFG
- The intersection of a CFL and regular set is a CFL
- Any regular language can be generated by a context-free grammar

6. Which of the following denotes Chomskian hiearchy?

- REG ? CFL ? CSL ? type0
- CFL ? REG ? type0 ? CSL
- CSL ? type0 ? REG ? CFL
- CSL ? CFL ? REG ? type0

7. The major difference between Mealy and Moore machine is about:

- Output Variations
- Input Variations
- All of the mentioned
- None of the mentioned

8. Basic limitation of FSM is that it

- Cannot remember arbitrary large amount of information
- Sometimes fails to recognize grammars that are regular
- Sometimes recognizes grammars are not regular
- None of these

9. The language of all words with at least 2 a's can be described by the regular expression

- All of these
- (a + b)* ab* a (a + b)*
- b* ab* a (a + b)*
- (ab)*a and a (ba)*

10. Mealy and Moore machine can be categorized as:

- Inducers
- Transducers
- Turing Machines
- PDA

11. Which of the functions can a turing machine not perform?

- Inserting a symbol
- Copying a string
- Accepting a pal
- Deleting a symbol

12. Which of the following strings is not generated by the following grammar? S ? SaSbS|∈

- aaabb
- abab
- aababb
- aabb

13. With reference of a DPDA, which among the following do we perform from the start state with an empty stack?

- all of the mentioned
- process the whole string
- end in final state
- end with an empty stack

14. Which of the following regular expression identity is true?

- (r*s*)* = (r + s)*
- r*s* = r* + s*
- (r + s)* = r* + s*
- r(*) = r*

15. Context-free grammar can be recognized by

- Both (b) and (c)
- 2-way linear bounded automata
- Push down automata
- Finite state automation

16. The most suitable data structure used to represent the derivations in compiler:

- Tree
- Linked List
- Queue
- Stack

17. Following context free grammar
    S —> aB | bA
    A —>b | aS | bAA
    B —> b | bS | aBB
    generates strings of terminals that have

- Equal number of a's and b's
- Odd number of a's and odd number b's
- Even number of a's and even number of b's
- Odd number of a's and even number of a's

18. A grammar that produces more than one parse tree for some sentence is called

- Ambiguous
- Unambiguous

- Regular
- None

19. A PDA machine configuration (p, w, y) can be correctly represented as:

- (current state, unprocessed input, stack content)
- unprocessed input, stack content, current state
- none of the mentioned
- (current state, stack content, unprocessed input)

20. The following grammar
    G = (N, T, P, S)
    N = {S, A, B, C}
    T = {a, b, c}
    P : S ? aS
    A ? bB
    B ? cC
    C ? a is

- Is type 3
- Is type 2 but not type 3
- Is type 1 but not type 2
- Is type 0 but not type 1

21. Context free language are closed under

- Union, Kleene closure
- Union, intersection
- Intersection, complement
- Complement, Kleene closure

22. Which among the following is the root of the parse tree?

- Starting Variable S
- Production P
- Variable V
- Terminal T

23. Consider the following CFG

S| aB S | bA
B | b A | a
B | bS A | aS
B | aBB A | bAA

Consider the following derivation

S | aB
| aaBB
| aaBb
| aabSb
| aabbAb
| aabbab

This derivation is

- Neither leftmost nor rightmost derivation
- A rightmost derivation
- Both leftmost and rightmost derivation
- A leftmost derivation

24. Which of the following cannot accept even palindrome over {a,b}

- NDFA
- PDA
- TM

- ALL

25. The set of all strings over the alphabet S = {a, b} (including ∈) is denoted by

- (a + b)*
- (a + b)+
- a*b*
- a+b+