COURSE2: CMP 313 Operation Research

NAME:_____ MATRIC NUMBER: _____

1. Given £={a,b,c,...z), if S=car, T= cap,the ST is __ A. ccaarp B. capcar C. carcap D. racpac
2. A language has a string |X|≤3 over X={0.1}. if it starts with 0 and ends with 1m ow many possible strings can the language generate? A. 4 B. 3 C. 2 D. 1
3. Language of Finite State Automaton is __ A. Type 0 B. Type 1 C. Type 2 D. Type 3
4. Which of the following is a property of a grammar?
A. Equivalency B. Recursiveness C. Left factoring D. All of the above
5. Given the grammar S==>aA, A==>bB, B==>cD, B==>£. What type of grammar is it?
A. Type 0 B. Type 1 C. Type 2 D. Type 3
6. Given S={a,b}, T={1,2} ST is __ A. ab12 B. a12b C. 1a2b D. a1b2
7. __ is the process of recognizing a string in a language by breaking it down to set of symbols and analyzing it against the grammar of the language. A. Grammar B. Derivation C. Parsing D. Sentential form
8. __ is a string of symbols derived from start symbol which contain Nonterminal as well as terminal symbols
A. Grammar B. Derivation C. Parsing D. Sentential form
9. Grammar bB==>Bb, aBa==>aaBa, S==>a S==>Ba is an example of __
A. Type 0 B. Type 1 C. Type 2 D. Type 3
10. Two types of derivation are __
A. Top down and bottom up B. Left most and right most C. All of the above D. None of the above
11. Acronym BNF means __
A. Backus Noun Format B. Backus Naur Format C. Backus Noun Form D. Backus Naur Form
12. Given the grammar G==>Ab means
A. G is a start symbol B. A is a nonterminal symbol C. b is a terminal symbol D. All of the above
13. Given that W==>*Z, this implies that __
A. Z derives from W using one or more productions B. Z derives from W using zero or more productions
C. Z derives from W using one production D. Z derives from W using zero production
14. free or unrestricted grammar can be recognized by__
A. Finite State Automaton B. Linear Bounded Machine C. Turing Machine D. Push Down Automaton
15. Given that |W| simply means __
A. Number of nonterminal symbols of W B. Number of terminal symbols of W C. Number of Start symbols of W
D. Number of variable or elements of W
16. Regular grammar is __ grammar. A. Type 0 B. Type 1 C. Type 2 D. Type 3
17. Corner brackets are used to indicate __ symbol. A. Terminal B. Non terminal C. Start D. None of the above
18. Given that W==>+Z, this implies that __
A. Z derives from W using one or more productions B. Z derives from W using zero or more productions
C. Z derives from W using one production D. Z derives from W using zero production
19. __ is a language used to describe the structure of another language
A. Syntax Language B. Lexicon Language C. Semantic Language D. Meta Language
20. Which of the following is not a property of a parse tree?
A. It has a node called root node B. It has a node called leave node
C. It has a node called Nonterminal node D. None of the above
21. __is the rule that governs the combination of valid words in a particular language
A. Syntax B. Semantic C. Lexicon D. All of the above
22. Context free grammar can be recognized by__
A. Finite State Automaton B. Linear Bounded Machine C. Turing Machine D. Push Down Automaton
23. __ is a sequence of production rules in order to get the input string
A. Grammar B. Grammar concatenation C. Derivation D. None of the above
24. __ is a finite sequence of symbols that are chosen from a set or alphabet.
A. Grammar B. String C. Terminal symbol D. Nonterminal symbol
25. Free grammars are recognized by __?
A. Finite State Automaton B. Linear Bounded Machine C. Turing Machine D. Push Down Automaton
26. if W= {a,b,c,£}. What is the length of W A. 5 B. 4 C. 3 D. 2 (E here means empty)
27. __is the meaning associated with a particular syntactic entity in a language
A. Syntax B. Semantic C. Lexicon D. All of the above

2. Given the grammar G==>Ab means
. G is a start symbol B. A is a nonterminal symbol C. b is a terminal symbol D. All of the
3. Given that W==>*Z, this implies that __
. Z derives from W using one or more productions B. Z derives from W using zero or more pr
. Z derives from W using one production D. Z derives from W using zero production
4. free or unrestricted grammar can be recognized by__
. Finite State Automaton B. Linear Bounded Machine C. Turing Machine D. Push Down
5. Given that |W| simply means __
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5. Regular grammar is __ grammar. A. Type 0 B. Type 1 C. Type 2 D. Type 3
7. Corner brackets are used to indicate __ symbol. A. Terminal B. Non terminal C. Start D
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9. __ is a language used to describe the structure of another language
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0. Which of the following is not a property of a parse tree?
. It has a node called root node B. It has a node called leave node
It has a node called Nonterminal node D. None of the above

5. (a) Given a summarized function of a K-Map to be $F=A+C+D^1$ (where D^1 is D complement) from the K-Map, use the given function to:

i. Draw a K-Map with input in each of the cells that produce the function (3 marks)

ii. Draw and mark-out all possible groupings in the K-Map (3 marks)

iii. In Tabular form use the K-Map to generate the inputs for all possible variables and the original/initial function (i.e. function before summarization) of the Boolean expression (3 marks)

iv. Write out the terms that produced all ones in the K-map (3 marks)

b. Mention advantage and disadvantage of using K-Map (3 marks).

BINGHAM UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF SCIENCE AND TECHNOLOGY
FIRST SEMESTER EXAMINATION, 2021/2022 SESSION
COURSE CODE: CMP 301 **CREDIT UNITS:** 3
COURSE TITLE: COMPUTER ARCHITECTURE **TIME:** 2.5 Hrs

Instruction: Answer question one and any other three questions only

1. (a) Given a summarized function of a K-Map to be $F=B^1D^1+A+C$ (where B^1 is B complement) from the K-Map, use the given function to:
   i. Draw a K-Map with input in each of the cells that produce the function (5 marks)
   ii. Draw and mark-out all possible groupings in the K-Map (5 marks)
   iii. In Tabular form use the K-Map to generate the inputs for all possible variables and the original/initial function (i.e. function before summarization) of the Boolean expression (5 marks)
   iv. Write out the terms that produced all ones in the K-map (5 marks)
   (b) What is K-Map? (1 mark) and Mention four (4) rules for grouping in K-Map (4 marks).

2. (a) Given a summarized function of a K-Map to be $F=BD+DC+A^1CD+ACD$ (where A^1 is A complement) from the K-Map, use the given function to:
   i. Draw a K-Map with input in each of the cells that produce the function (3 marks)
   ii. Draw and mark-out all possible groupings in the K-Map (3 marks)
   iii. In Tabular form use the K-Map to generate the inputs for all possible variables and the original/initial function (i.e. function before summarization) of the Boolean expression (3 marks)
   iv. Write out the terms that produced all ones in the K-map (3 marks)
   (b) What is Computer Bus? (1 marks), and list the three (3) types of computer bus (2 marks).

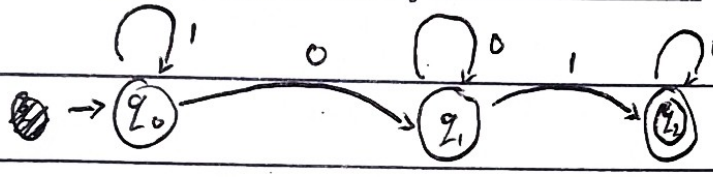
3. (a) Given a summarized function of a K-Map to be $F=D^1+C+A^1B$ (where D^1 is D complement) from the K-Map, use the given function to:
   i. Draw a K-Map with input in each of the cells that produce the function (3 marks)
   ii. Draw and mark-out all possible groupings in the K-Map (3 marks)
   iii. In Tabular form use the K-Map to generate the inputs for all possible variables and the original/initial function (i.e. function before summarization) of the Boolean expression (3 marks)
   iv. Write out the terms that produced all ones in the K-map (3 marks)
   (b) Briefly explain the Fetch-Decode-Execute process between the Micro-Processor and Computer Memory (3 marks).

4. (a) Given a summarized function of a K-Map to be $F=BD+B^1D^1$ (where B^1 is B complement) from the K-Map, use the given function to:
   i. Draw a K-Map with input in in each of the cells that produce the function (3 marks)
   ii. Draw and mark-out all possible groupings in the K-Map (3 marks)
   iii. In Tabular form use the K-Map to generate the inputs for all possible variables and the original/initial function (i.e. function before summarization) of the Boolean expression (3 marks)
   iv. Write out the terms that produced all ones in the K-map (3 marks)
   (b). What is Computer Architecture? (1 mark) and Mention two (2) benefits of studying Computer Architecture to Computer Scientists (3 marks).

Glorious Home Call
of a Mother with a
Heart of Gold

Deaconess
ROSELINE EDEH
(Rosa Nwaelu)
Buried on Saturday 2nd April, 2022

e) Use the FSA below to generate a transition table?



FSA

f) What are the 2 types of FSA?

g) What are the DFSA and NDFSA?

h) Draw a transition table for