Q16) Analyze the strings of length 6 or less in the regular set represented by the regular expression $(01 + 0)^*(00 + b)$
(a) 0100 (b) 0001 (c) 01000 (d) All of the above.

Q17) Analyze which of the following regular expression is equivalent to $0^*(0+1)^*$
a) 0^*1^* b) 0^*+1^* c) $(01)^*$ d) None of these

Q18) Connect the following statement with the options:
Statement: All suitably lengthy words in a regular language can have a middle piece of words repeated several times to form a that also belongs to the same language.
(a) Turing Machine (b) Arden's theorem (c) Pumping Lemma (d) None of these.

Q19) Analyze which of the following statements are true.
a) Under infinite union, the class of regular languages is closed.
b) If L1 U L2 are regular then both L1 and L2 must be regular.

(a) a only (b) b only (c) Both a and b (d) Neither a nor b

CO

Q20) Analyze which one of the following can be a pumping length (the constant guaranteed by the pumping lemma) for L if the regu language $L = \{x \mid x = p3+4n \text{ or } x = q11+13n, n \geq 0\}$ is for $\Sigma = \{p, q\}$.
(a) 6 (b) 6 (c) 10 (d) 20

CO5,

Q21) Identify the language generated by the following Grammar
S-> PQ
P->a
Q->b
(a) (ab) (b) (a^*b^*)
(c) $(ab)^*$ (d) none of these

CO1, L2

Q22) There are _____ tuples in Grammar
(a) 3 (b) 4 (c) 5 (d) 6

CO1, L2

Q23) A grammar G = (V, T, P, S) in which V is

(a) Set of variables (b) Set of terminals (c) Set of variables and non -terminals (d) Production rule

CO1, L2

Q24) Regular Grammar is also called _____
(a) Type 0 (b) Type 1 (c) Type 2 (d) Type 3

CO1, L2

Q25) The set of all strings that can be derived from a grammar is said to be _____
(a) Language (b) Variables (c) Production rule (d) None of these

CO1, L2

Q26) Which of the following relates to Chomsky hierarchy?
(a) Type3<Type 2<Type 1<Type 0
(b) Regular<CFL<CSL<Unrestricted
(c) CSL<Unrestricted<CF<Regular
(d) Both A and B

CO1, L2

Registration No: [redacted] Paper Co...

Course Code:CSE322 **Max Marks: 30**

Course Title:FORMAL LANGUAGES AND AUTOMATION THEORY

Time Allowed: 01:30hrs.

Read the following instructions carefully before attempting the question paper.

1. Match the Paper Code shaded on the OMR Sheet with the Paper code mentioned on the question paper and ensure that both are the same.

2. This question paper contains 30 questions of 1 mark each. 0.25 marks will be deducted for each wrong answer.

3. All questions are compulsory.

4. Do not write or mark anything on the question paper and/or on rough sheet(s) which could be helpful to any student in copying, except your registration number on the designated space.

5. Submit the question paper and the rough sheet(s) along with the OMR sheet to the invigilator before leaving the examination hall.

Q1) Determine the number of states in DFA that accept the following language $L= \{a^n b^{2m} \mid n, m \geq 1\}$

(a) 2 (b) n (c) m (d) 5

CO1, L2

Q2) Determine the number of strings of length less than 4 contains the language described by regular expression $(x+y)^* y (a+ab)^*$

(a) 3 (b) 9 (c) 10 (d) 11

CO1, L2

Q3) Determine the number of states for a minimum DFA that accept the language $L=\{w|w$ has $\{0,1\}^*$, that are divisible by 3 and 5 respectively

(a) 15 (b) 11 (c) 10 (d) 9

CO1, L2

Q4) Representation of the output of mealy machine format is :

(a) $Op(t)= \delta(Op(t))$ (b) $Op(t)= \delta(Op(t)i(t))$ (c) $Op(t): \Sigma$ (d) None of the above mentioned

CO1, L2

Q5) Identify the transitions which takes without consuming any input symbol

(a) ε-transitions (b) λ-transitions (c) ε-transitions & λ-transitions (d) None of the above

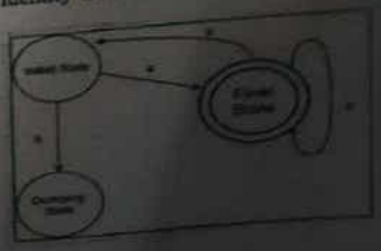
CO1, L2

Q6) Identify from the following that the behaviour of a NFA can be stimulated by DFA .

(a) Depends on NFA (b) Never (c) Always (d) Sometimes

CO1, L2

Q7) Identify from the following that will not be accepted by the given DFA?



abbbaabb (c) ababaabaa (d) abbaabbaa

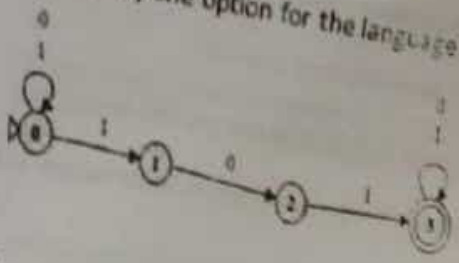
Q8) Find the reason that why the string WWR is not recognized by any FSM ? (WR is th

(a) A FSM cannot remember first and last inputs (b) A FSM cannot match W wi

(d) A FSM cannot remember arbitrarily large amount of information

CO1, L2

Q9) Choose any one option for the language that is accepted by given NFA :



(a) all strings containing 101 (b) all strings start with 101 (c) all strings end with 101 (d) only for 101 string

Q10) Determine the right option from below for statement 1 and 2. CO1, L2

Statement 1: All DFA are considered as NFA
Statement 2: All NFA are not considered as DFA

(a) Statement 1 is wrong and Statement 2 is correct (b) Statement 1 and 2 both Wrong
(c) Statement 1 is correct and Statement 2 is wrong (d) Statement 1 and 2 both Correct

Q11) Represent the following set by regular expression CO1, L2

{w ∈ {a,b}* | w has atmost two a's}

(a) b*ab* + b*ab*ab* (b) b* + b*a*b* + b*a*b*a*b* (c) b*a*b* + b*a*b*ab* (d) b* + b*ab* + b*ab*ab*

Q12) The set of all strings over {0,1} having 0011 as a substing is represented by CO2, L4

(a) 0*1*0101(0+1)* (b) 0*1*01010*1* (c) (0+1)*0101(0+1)* (d) (0+1)*01010*1*

Q13) Which of the following expression is true? CO2, L4

(a) (a+b)*a(a+b)*b(a+b) = (a+b)*ab(a+b)* (b) (a+b)*ab(a+b)*+b*a* = (a+b)* (c) (ab)*a = a(ba)* (d) All of the above

Q14) Which type of the following language is represented by regular expression? CO2, L4

(a) Type 3 language (b) Type 2 language (c) Type 1 language (d) Type 0 language

CO2, L4

Q15) Analyze which of the following statement is true for {w ∈ {a,b} | w is ba*+a*}.*

(a) Starting with one b and having no other b's or having no b's but only a's.

(b) Having no b's but only a's

(c) Starting with one b followed by a's. CO2, L4

(d) None of the above.

Q27) Which of the following string is generated by the grammar S -> 0XY X->0X/0 Y->1Y/1 CO1, L2

a) 001 b) 01 c) 10 d) 1001

Q28) Which of the following strings do not belong the given regular expression p*+(p+qpx)? CO1, L2

(a) p (b) pqpx (c) ppqpx (d) xqpx

Q29) Which type of grammar is it? S→Spq,s→a CO1, L2

(a) Left linear Grammar (b) Right Linear Grammar (c) Left and Right linear (d) All of the above

Q30) The grammars in which all of the rules contain only one non-terminal on the right -hand side is called CO1, L2

(a) Left Linear Grammar (b) Right Linear Grammar (c) Left and Right Linear Grammar (d) Linear Grammar

--End of Question paper--