

Code No: 54055

Set No. 1

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.Tech. II Sem., II Mid-Term Examinations, April – 2014

FORMAL LANGUAGES AND AUTOMATA THEORY

Objective Exam

Name: \_\_\_\_\_ Hall Ticket No. 

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Answer All Questions. All Questions Carry Equal Marks. Time: 20 Min. Marks: 10.

**I Choose the correct alternative:**

1. Context free languages are closed under “inverse homomorphism” is \_\_\_\_\_ [     ]  
A) True                      B) False                      C) True or False                      D) Can't say
2. Turing machine are \_\_\_\_\_ languages [     ]  
A) RL                      B) CFL                      C) Recursively enumerable                      D) CSL
3. The production  $U \rightarrow V$  where  $U \in (V \cup T)^+$ ,  $V \in (V \cup T)^*$  is related to \_\_\_\_\_ grammar [     ]  
A) type 0                      B) type 1                      C) type 2                      D) type 3
4. Which automata is associated with context sensitive language [     ]  
A) Turing machine      B) finite automata      C) PDA                      D) LBA
5. Which of the following holds [     ]  
A) P is not in NP      B) NP is not in PSPACE      C) P is not in PSPACE      D) P is in NP
6. CFL are not closed under \_\_\_\_\_ [     ]  
A) Union                      B) Kleene star                      C) Complementation                      D) Product
7. A production of the form  $A \rightarrow B$ ,  $A, B \in V$  is called \_\_\_\_\_ production. [     ]  
A) unit                      B) null able                      C) multi                      D) normal
8. Which of the following is not NP complete [     ]  
A) 3-coloring problem                      B) traveling salesman problem  
C) knapsack problem                      D) 2-SAT problem
9. In a CFG each production is of the form \_\_\_\_\_ [     ]  
A)  $\alpha \rightarrow A$                       B)  $\alpha \rightarrow \varepsilon A$                       C)  $A \rightarrow \alpha B$                       D)  $A \rightarrow \emptyset$
10. Which of the following is subset to all \_\_\_\_\_ [     ]  
A) type 0                      B) type 1                      C) type 2                      D) type 3

Cont.....2

**II Fill in the blanks:**

11. PCP stands for \_\_\_\_\_
12. Turing Machine contains \_\_\_\_\_ tuples.
13. In LBA the input will be present between the \_\_\_\_\_ markers.
14. The Language defined by  $S \rightarrow AB$ ,  $A \rightarrow aA$ ,  $B \rightarrow b$  is \_\_\_\_\_
15. For the language  $L = \{WCW^T / W \in (a+b)^*\}$  there is a \_\_\_\_\_ PDA which accepts the language.
16. A CFG is said to be in \_\_\_\_\_ if all productions have the form  $A \rightarrow BC$ ,  $A \rightarrow b$  where  $b \in T$ ,  $A, B, C \in V^*$ .
17. Type 0 language accepted by \_\_\_\_\_
18. A problem whose language is recursive is said to be \_\_\_\_\_
19. In a derivation tree every leaf has a label from  $V \cup T \cup \{\epsilon\}$  then it is called \_\_\_\_\_
20. PDA maintains \_\_\_\_\_ components.

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Set No. 2

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FORMAL LANGUAGES AND AUTOMATA THEORY

Objective Exam

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Answer All Questions. All Questions Carry Equal Marks. Time: 20 Min. Marks: 10.

**I Choose the correct alternative:**

1. Which automata is associated with context sensitive language [     ]  
A) Turing machine    B) finite automata    C) PDA    D) LBA
2. Which of the following holds [     ]  
A) P is not in NP    B) NP is not in PSPACE    C) P is not in PSPACE    D) P is in NP
3. CFL are not closed under \_\_\_\_\_ [     ]  
A) Union    B) Kleene star    C) Complementatation    D) Product
4. A production of the form  $A \rightarrow B$ ,  $A, B \in V$  is called \_\_\_\_\_ production. [     ]  
A) unit    B) null able    C) multi    D) normal
5. Which of the following is not NP complete [     ]  
A) 3-coloring problem    B) traveling salesman problem  
C) knapsack problem    D) 2-SAT problem
6. In a CFG each production is of the form \_\_\_\_\_ [     ]  
A)  $\alpha \rightarrow A$     B)  $\alpha \rightarrow \varepsilon A$     C)  $A \rightarrow \alpha B$     D)  $A \rightarrow \emptyset$
7. Which of the following is subset to all \_\_\_\_\_ [     ]  
A) type 0    B) type 1    C) type 2    D) type 3
8. Context free languages are closed under "inverse homomorphism" is \_\_\_\_\_ [     ]  
A) True    B) False    C) True or False    D) Can't say
9. Turing machine are \_\_\_\_\_ languages [     ]  
A) RL    B) CFL    C) Recursively enumerable    D) CSL
10. The production  $U \rightarrow V$  where  $U \in (V \cup T)^+$ ,  $V \in (V \cup T)^*$  is related to \_\_\_\_\_ grammar [     ]  
A) type 0    B) type 1    C) type 2    D) type 3

Cont.....2

**II Fill in the blanks:**

11. The Language defined by  $S \rightarrow AB$ ,  $A \rightarrow aA$ ,  $B \rightarrow b$  is \_\_\_\_\_
12. For the language  $L = \{WCW^T / W \in (a+b)^*\}$  there is a \_\_\_\_\_ PDA which accepts the language.
13. A CFG is said to be in \_\_\_\_\_ if all productions have the form  $A \rightarrow BC$ ,  $A \rightarrow b$  where  $b \in T$ ,  $A, B, C \in V^*$ .
14. Type 0 language accepted by \_\_\_\_\_
15. A problem whose language is recursive is said to be \_\_\_\_\_
16. In a derivation tree every leaf has a label from  $V \cup T \cup \{\epsilon\}$  then it is called \_\_\_\_\_
17. PDA maintains \_\_\_\_\_ components.
18. PCP stands for \_\_\_\_\_
19. Turing Machine contains \_\_\_\_\_ tuples.
20. In LBA the input will be present between the \_\_\_\_\_ markers.

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Set No. 3

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.Tech. II Sem., II Mid-Term Examinations, April – 2014

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Answer All Questions. All Questions Carry Equal Marks. Time: 20 Min. Marks: 10.

**I Choose the correct alternative:**

1. CFL are not closed under \_\_\_\_\_ [     ]  
A) Union                      B) Kleene star                      C) Complementation                      D) Product
2. A production of the form  $A \rightarrow B$ ,  $A, B \in V$  is called \_\_\_\_\_ production. [     ]  
A) unit                      B) null able                      C) multi                      D) normal
3. Which of the following is not NP complete [     ]  
A) 3-coloring problem                      B) traveling salesman problem  
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4. In a CFG each production is of the form \_\_\_\_\_ [     ]  
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5. Which of the following is subset to all \_\_\_\_\_ [     ]  
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6. Context free languages are closed under "inverse homomorphism" is \_\_\_\_\_ [     ]  
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7. Turing machine are \_\_\_\_\_ languages [     ]  
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A) type 0                      B) type 1                      C) type 2                      D) type 3
9. Which automata is associated with context sensitive language [     ]  
A) Turing machine                      B) finite automata                      C) PDA                      D) LBA
10. Which of the following holds [     ]  
A) P is not in NP                      B) NP is not in PSPACE                      C) P is not in PSPACE                      D) P is in NP

Cont.....2

**II Fill in the blanks:**

11. A CFG is said to be in \_\_\_\_\_ if all productions have the form  $A \rightarrow BC$ ,  $A \rightarrow b$  where  $b \in T$ ,  $A, B, C \in V^*$ .
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18. In LBA the input will be present between the \_\_\_\_\_ markers.
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20. For the language  $L = \{ WCW^T / W \in (a+b)^* \}$  there is a \_\_\_\_\_ PDA which accepts the language.

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Set No. 4

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A) 3-coloring problem                      B) traveling salesman problem  
C) knapsack problem                      D) 2-SAT problem
2. In a CFG each production is of the form \_\_\_\_\_ [      ]  
A)  $\alpha \rightarrow A$                       B)  $\alpha \rightarrow \varepsilon A$                       C)  $A \rightarrow \alpha B$                       D)  $A \rightarrow \emptyset$
3. Which of the following is subset to all \_\_\_\_\_ [      ]  
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4. Context free languages are closed under "inverse homomorphism" is \_\_\_\_\_ [      ]  
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A) unit                      B) null able                      C) multi                      D) normal

Cont.....2

**II Fill in the blanks:**

11. A problem whose language is recursive is said to be \_\_\_\_\_
12. In a derivation tree every leaf has a label from  $V \cup T \cup \{ \epsilon \}$  then it is called \_\_\_\_\_
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20. Type 0 language accepted by \_\_\_\_\_

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