

TOC Unit Test II Date: 24/11/2021 Class: TE9, 10, 11

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* Required

1

Roll Number *

33213

2

Name of the Student *

CHHATRE SWAPNIL AJIT

3

[CO4] Which of the following is true? *
(1 Point)

- ☒ a. For every CFG, there exists an equivalent DPDA
- ☐ b. For every CFG, there exists an equivalent NPDA
- ☐ c. For every CFG, there exists an equivalent DFA
- ☐ d. For every NPDA, there exists an equivalent DPDA

4

[CO4] The transition a Push down automaton makes is additionally dependent upon the *
(1 Point)

- ☐ a. Input Tape
- ☐ b. Queue
- ☒ c. Stack
- ☐ d. Current state

5

[CO4] A transition of a PDA can be represented by *
(1 Point)

- ☐ a. Transition graph
- ☐ b. Transition table
- ☐ c. ID
- ☒ d. All the above

6

[CO4] The instantaneous description of a PDA has *
(1 Point)

- ☐ a. Current state
- ☐ b. Remaining input
- ☐ c. Top of the stack
- ☐ d. All the above

7

[CO4] The stack in PDA is also known as *
(1 Point)

- ☒ a. Memory

- ☐ b. Store
- ☐ c. Non-Queue
- ☐ d. None of the above

8

[CO4] PDA is used to recognize *
(1 Point)

- ☐ a. CSL
- ☒ b. CFL
- ☐ c. UL
- ☐ d. All the above

9

[CO4] Which of the following languages is not accepted by a PDA *
(2 Points)

- ☐ a. $L = \{ a^n b^m c^m + n \mid m, n > 0 \}$
- ☐ b. $L = \{ a^n b^m c^m d^n \mid m, n > 0 \}$
- ☒ c. $L = \{ a^m b^m c^m \mid m > 0 \}$
- ☐ d. $L = \{ a^n b^m + n c^m \mid m, n > = 0 \}$

10

[CO4] The language $L = \{ w c w^R \mid w \in \{a, b\}^* \}$ is accepted by *
(2 Points)

- ☐ a. DFA
- ☐ b. DPDA
- ☒ c. TM
- ☐ d. Both b and c

11

[CO5] Which of the following language cannot be represented by Turing Machine? *
(2 Points)

- ☐ a. $L = \{ a^n b^n c^n d^n \mid n > = 0 \}$
- ☐ b. $L = \{ 1^n 2^n 1^n 2^n \mid n > = 0 \}$
- ☐ c. $L = \{ a^{(2^n)} \mid n > 0 \}$
- ☒ d. None of the above

12

[CO5] An arbitrary TM M is given and a language L is defined as follows-
 $L = (0 + 00)^*$ if M accepts at least one string
 $L = (0 + 00 + 000)^*$ if M accepts at least two strings
 $L = (0 + 00 + 000 + 0000)^*$ if M accepts at least three strings
 similarly
 $L = (0 + 00 + 000 + 0000 + \dots + 0^n)^*$ if M accepts at least n-1 strings

Choose the correct statement *
(2 Points)

- ☐ a. We cannot say anything about L, as the question of whether or not a TM accepts a string is undecidable
- ☒ b. L is context-sensitive but not regular
- ☐ c. L is context-free but not regular
- ☐ d. L is not a finite set

13

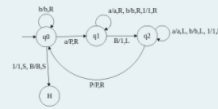
[CO5] What is the working of the given TM *
(1 Point)



- ☐ It computes 1's complement of a binary number

- ☐ It adds two binary numbers
- ☐ It subtracts one number from another
- ☒ It adds two unary numbers

14



[CO5] Which of the following IDs are possible with respect to the given TM *

(2 Points)

- ☐ aabbH11
- ☒ baPaq211
- ☐ bbPaq2a1
- ☒ PbPbbPH111

15

[CO5] What is the minimum number of states required in a TM that accepts a string which starts with a. Assume that there are both Ha and Hr states are not counted *

(1 Point)

- ☐ 3
- ☒ 2
- ☐ 1
- ☐ 4

16

[CO5] Which of the following is true if two consecutive IDs of a Turing Machine are Baaq3bb Baaq2aab *

(2 Points)

- ☐ current state is q2 and read/write head is pointing to b
- ☒ after the transition, b is replaced by a
- ☐ after the transition read/write head is shifted left
- ☒ current state is q3 and read/write head is pointing to a
- ☐ current state is q3 and read/write head is pointing to b

17

[CO6] Choose the correct statement *

(1 Point)

- ☒ a. There exists a universal TM which can simulate any TM M on its input W
- ☐ b. There does not exist a universal TM which can simulate any TM M on its input W
- ☐ c. The universal language is recursive

18

[CO6] Recursively Enumerable Language are not closed under following Operation *

(1 Point)

- ☐ a. Union
- ☐ b. Intersection
- ☒ c. Complementation
- ☐ d. Kleene closure

19

[CO6] "Does finite Automata Accept Regular Language?" What kind of a problem it is? *

(1 Point)

- ☒ a. Decidable Problem
- ☐ b. Undecidable Problem
- ☐ c. Unsolvable
- ☐ d. None of the above

20

[CO6] A Language is Recursively Enumerable if *

(1 Point)

- ☒ a. For each input string, the Machine will halt in the accept or reject state
- ☐ b. For some input string, the machine enters an infinite loop
- ☐ d. It is accepted by FSM or PDA
- ☐ d. None of the above

21

[CO6] Computational complexity theory aims to *

(2 Points)

- ☐ a. introduce classes of problems that have similar complexity (require a similar quantity of computational resources)
- ☐ b. study the intrinsic properties of complexity classes
- ☐ c. identify algorithmic feasibility and efficiency
- ☐ d. a & b
- ☒ e. a, b, c
- ☐ f. b & c

22

[CO6] Which of the following languages is not recursively enumerable? *

(2 Points)

- ☐ a. {a, b, c}
- ☐ b. the odd integers
- ☐ c. the prime numbers
- ☐ d. the halting Turing machines
- ☐ e. none of the above
- ☒ f. all of the above

23

[CO6] Which of the following languages is not recursive? *

(2 Points)

- ☐ a. {a, b, c}
- ☐ b. the odd integers
- ☒ c. the prime numbers
- ☐ d. the halting Turing machines
- ☐ e. none of the above
- ☐ f. all of the above

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