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Time taken	1 hour 22 mins
Grade	50.83 out of 60.00 (85%)

Question 1

Partially correct

Mark 0.50 out of 1.00

Let $P \neq NP$. Which of the following is/are true? (It is known that $2SAT \in P$)

Select one or more:

☒ a. $2SAT \in NP$. ✓

☐ b. $3SAT \leq_P 2SAT$.

☐ c. $2SAT \in coNP$.

☐ d. $3SAT \in P$.

Your answer is partially correct.

You have correctly selected 1.

The correct answers are: $2SAT \in NP$., $2SAT \in coNP$.

Question 2

Correct

Mark 2.00 out of 2.00

Consider the following grammar,

$S \rightarrow AaA$

$A \rightarrow bA \mid Ab \mid Ac \mid cA \mid aaA \mid Aaa \mid aAa \mid \epsilon$

Which of the following strings is/are generated by the above grammar?

Select one or more:

☒ a. $c^{21}b^{22}a^{20}$. ✗

☒ b. $b^{21}a^{21}c^{23}$. ✓

☒ c. $a^{20}b^{21}c^{23}$. ✗

☒ d. $a^{21}b^{22}c^{20}$. ✓

Your answer is correct.

The correct answers are: $a^{21}b^{22}c^{20}$., $b^{21}a^{21}c^{23}$.

Question 3

Correct

Mark 2.00 out of 2.00

Which languages correspond to the following regular expression?

$(0+1)^*(01+10)(0+1)^*$

Select one or more:

☐ a. $\{0,1\}^*$

☒ b. $\{ w \mid w \text{ contains } 01 \text{ or } 10 \text{ as a substring} \}$ ✓

☒ c. $\{ w \mid w \text{ contains atleast one } 0 \text{ and one } 1 \}$ ✓

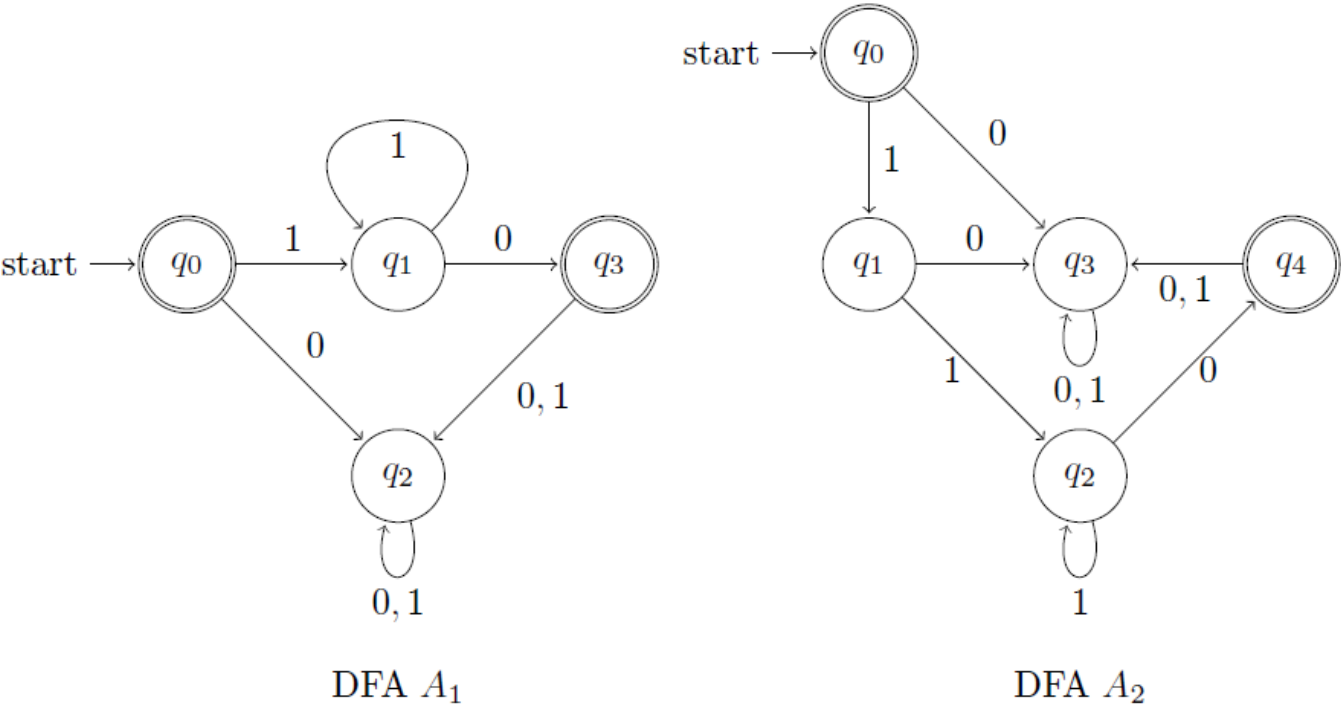
☒ d. $\{ w \mid \text{length of } w \text{ is } \geq 2 \}$ ✗

Your answer is correct.

The correct answers are: $\{ w \mid w \text{ contains } 01 \text{ or } 10 \text{ as a substring} \}$, $\{ w \mid w \text{ contains atleast one } 0 \text{ and one } 1 \}$

Question 4
Incorrect
Mark 0.00
out of 2.00

Consider the following two DFAs A1 and A2 :



Which one of the following is true?

- Select one:
- ☐ a. $L(A_1) = L(A_2)$.
 - ☐ b. $L(A_1)$ and $L(A_2)$ are incomparable.
 - ☐ c. $L(A_2)$ is a proper subset of $L(A_1)$.
 - ☒ d. $L(A_1)$ is a proper subset of $L(A_2)$. ✖

Your answer is incorrect.
The correct answer is: $L(A_2)$ is a proper subset of $L(A_1)$.

Question 5
Incorrect
Mark 0.00
out of 1.00

Consider the following languages :

- $L_1 = \{ 0^n 1^m 0^n \mid n, m \geq 0 \}$
- $L_2 = \{ 0^n 1^m 0^n \mid n, m \geq 0 \}$
- $L_3 = \{ 0^n 1^m 0^n \mid n, m \geq 0 \}$

Which of these languages are context free?

- Select one:
- ☐ a. L_3 only.
 - ☐ b. L_2 and L_3 .
 - ☒ c. L_1 and L_2 . ✖
 - ☐ d. L_1 only.

Your answer is incorrect.
The correct answer is: L_1 only.

Question 6
Correct
Mark 1.00
out of 1.00

Consider a decision problem P and a computable mapping $f : \Sigma^* \rightarrow \Sigma^*$. f maps "yes" instances of P to the "yes" instances of HTM , and "no" instances of P to "no" instances of HTM . Which of the following is true?

- Select one:
- ☒ a. The existence of f says nothing about whether there is an algorithm for P. ✔
 - ☐ b. The existence of f implies that there is no algorithm for P.
 - ☐ c. HTM can be solved using f.
 - ☐ d. The existence of f implies the existence of an algorithm for P.

Your answer is correct.
The correct answer is: The existence of f says nothing about whether there is an algorithm for P.

Question 7

Correct

Mark 2.00
out of 2.00

Consider the following languages :

1. $L_1 = \{ \langle M \rangle \mid M \text{ is a TM that takes more than } 2^{340} \text{ steps on some input} \}$.
2. $L_2 = \{ \langle M \rangle \mid M \text{ is a TM that takes more than } 2^{340} \text{ steps on all inputs} \}$.

Which of the following is true?

Select one:

- ☒ a. Both L_1 and L_2 are decidable. ✓
- ☐ b. L_2 is decidable but L_1 is not decidable.
- ☐ c. L_1 is decidable but L_2 is not decidable.
- ☐ d. Both L_1 and L_2 are not decidable.

Your answer is correct.

The correct answer is: Both L_1 and L_2 are decidable.

Question 8

Correct

Mark 1.00
out of 1.00Consider two decision problems P and Q. Given the fact that $P \leq_p Q$, which of the following can be inferred?

Select one:

- ☒ a. If P cannot be solved in polynomial time, then Q can not be solved in poly-time. ✓
- ☐ b. If Q cannot be solved in polynomial time, then P can not be solved in poly-time.
- ☐ c. Both P and Q can be solved in polynomial time.
- ☐ d. If P can be solved in poly-time, then Q must be solved in poly-time.

Your answer is correct.

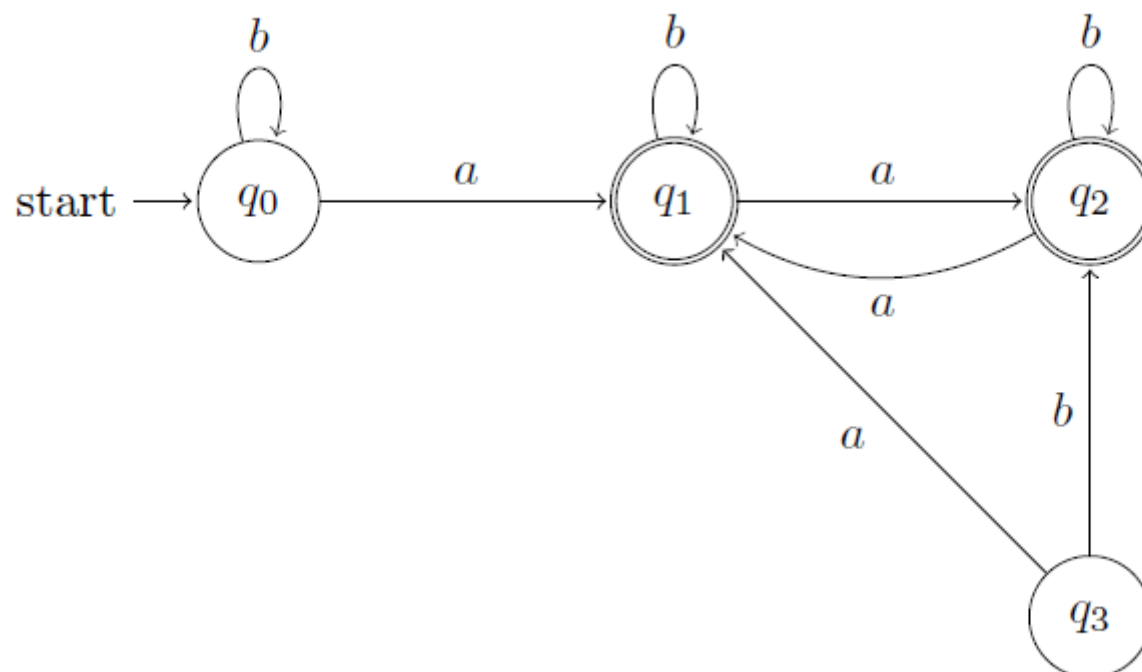
The correct answer is: If P cannot be solved in polynomial time, then Q can not be solved in poly-time.

Question 9

Correct

Mark 2.00
out of 2.00

The minimum state automaton equivalent to the DFA below has the following number of states?



Select one:

- ☐ a. 1.
- ☒ b. 2. ✓
- ☐ c. 4.
- ☐ d. 3.

Your answer is correct.

The correct answer is: 2.

Question 10
Correct
Mark 2.00
out of 2.00

Which of the following statements is/are false?

Select one or more:

- ☒ a. Every language in the complexity class NP is not necessarily decidable. ✓
- ☐ b. Complement of a decidable language is Turing recognizable.
- ☐ c. All finite languages are decidable.
- ☒ d. The intersection of a regular language and a decidable language cannot be regular. ✓

Your answer is correct.

The correct answers are: Every language in the complexity class NP is not necessarily decidable., The intersection of a regular language and a decidable language cannot be regular.

Question 11
Correct
Mark 1.00
out of 1.00

Consider the following languages

$L_1 = \{0^p 1^q 0^r \mid p, q, r \geq 0\}$

$L_2 = \{0^p 1^q 0^r \mid p, q, r \geq 0, q \neq r\}$

Which of the following statements is/are true?

Select one or more:

- ☒ a. L_1 is context free. ✓
- ☒ b. $L_1 \cap L_2$ is context-free. ✓
- ☐ c. L_2 is accepted by a Turing machine and L_1 is not accepted by a Turing machine.
- ☒ d. $L_1 \cup L_2$ is context-free. ✓

Your answer is correct.

The correct answers are: L_1 is context free., $L_1 \cup L_2$ is context-free., $L_1 \cap L_2$ is context-free.

Question 12
Correct
Mark 2.00
out of 2.00

Consider the following statements :

1. It is known that NP-complete problems can never be solved in polynomial time.
2. A poly-time solution to an NP-complete problem, implies a poly-time solution to each NP-complete problem.
3. Checking whether a given number is not prime is an NP-complete problem.

Then :

Select one:

- ☐ a. 1, 2, and 3 are false.
- ☐ b. 1 and 2 are true but 3 is false.
- ☒ c. 1 and 3 are false but 2 is true. ✓
- ☐ d. 2 and 3 are true but 1 is false.

Your answer is correct.

The correct answer is: 1 and 3 are false but 2 is true.

Question 13
Correct
Mark 2.00
out of 2.00

Consider two problems :

Membership problem : $P_1 = \{ \langle X, w \rangle \mid X \text{ is a computation model and } w \in L(X) \}$.

Emptiness problem : $P_2 = \{ \langle X \rangle \mid X \text{ is a computation model and } L(X) = \emptyset \}$.

Which of the following statements is/are true?

Select one or more:

- ☒ a. Both P_1 and P_2 are decidable if X is a CFG. ✓
- ☐ b. P_2 is undecidable if X is a DPDA.
- ☒ c. If X is a DFA or a CFG then P_1 is decidable and if X is a Turing machine then P_1 is undecidable. ✓
- ☐ d. If X is a CFG then, only P_1 is decidable.

Your answer is correct.

The correct answers are: If X is a DFA or a CFG then P_1 is decidable and if X is a Turing machine then P_1 is undecidable., Both P_1 and P_2 are decidable if X is a CFG.

Question 14

Partially correct

Mark 0.33 out of 1.00

Let L be a language over $\{0,1\}^*$ and F be a finite subset of $\{0,1\}^*$. Which of the following statements is/are false?

Select one or more:

- ☒ a. $L \cap F$ need not be regular. ✓
- ☐ b. $L \cap F$ is regular.
- ☐ c. $L \cup F$ is regular.
- ☐ d. $L - F$ is regular.

Your answer is partially correct.

You have correctly selected 1.

The correct answers are: $L - F$ is regular., $L \cap F$ need not be regular., $L \cup F$ is regular.

Question 15

Partially correct

Mark 1.33 out of 2.00

Consider the following languages :

$$L_1 = \{ 0^p 1^q 0^{(p+q)} \mid p, q, r \geq 0 \}$$

$$L_2 = \{ 0^p 1^q 0^{(p+q)} \mid p, q, r \geq 0, (p+q) \bmod 4 \equiv 3 \}$$

Which of the following statements is/are true?

Select one or more:

- ☒ a. L_1 is context free. ✓
- ☐ b. Complement of L_1 is not deterministic context free.
- ☒ c. L_1 is deterministic context free. ✓
- ☐ d. L_2 is DCFL.

Your answer is partially correct.

You have correctly selected 2.

The correct answers are: L_1 is context free., L_1 is deterministic context free., L_2 is DCFL.

Question 16

Correct

Mark 2.00 out of 2.00

L_1 is a Turing recognizable language over Σ . An algorithm A effectively enumerates its words as w_1, w_2, w_3, \dots . Define another language L_2 over $\Sigma \cup \{\#\}$ as $\{ w_i \# w_j : w_i, w_j \in L_1, i \leq j \}$.

Here $\#$ is a new symbol. Consider the following assertions.

S_1 : L_1 is Decidable implies L_2 is Decidable.

S_2 : L_2 is Decidable implies L_1 is Decidable.

Then which one of the following options is correct?

Select one:

- ☐ a. S_1 is true but S_2 is not true.
- ☒ b. Both S_1 and S_2 are true. ✓
- ☐ c. S_2 is true but S_1 is not true.
- ☐ d. Neither is true.

Your answer is correct.

The correct answer is: Both S_1 and S_2 are true.

Question 17

Incorrect

Mark 0.00 out of 2.00

Let L_1 be the language corresponding to the regular expression $(0 + 1)^* 001^*$ and L_2 be the language corresponding to the regular expression $110(1 + 0)^*$. Which one of the following regular expression corresponds to the language $(L_1 \cap L_2)$?

Select one:

- ☐ a. $(0 + 1)^* 00110(1 + 0)^*$.
- ☐ b. $110(1 + 0)^* 001^*$.
- ☒ c. 110001^* . ✗
- ☐ d. $(0 + 1)^* 001^* 110(1 + 0)^*$.

Your answer is incorrect.

The correct answer is: $110(1 + 0)^* 001^*$.

Question 18
Correct
Mark 1.00
out of 1.00

Adding non-determinism to which of the following computational model increases its power?

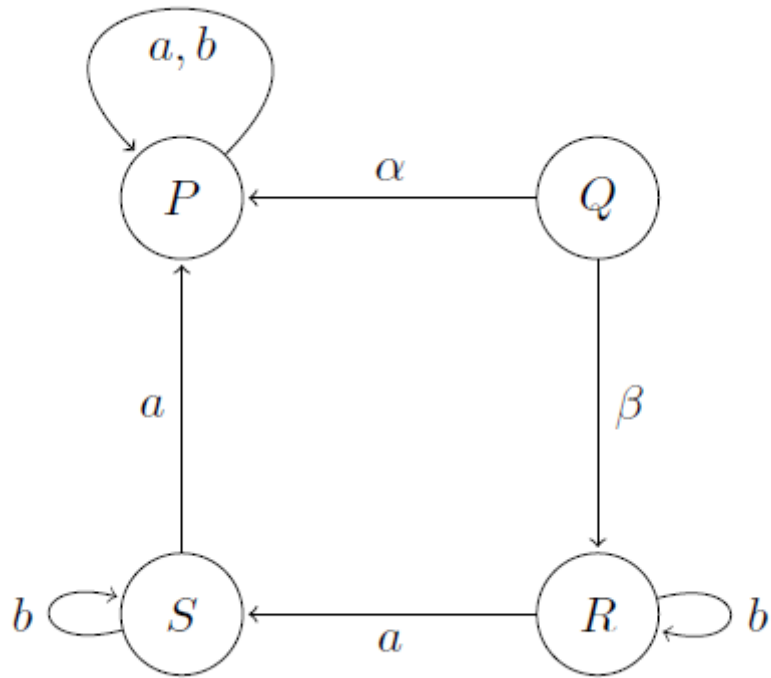
Select one or more:

- ☒ a. DPDA. ✓
- ☐ b. TM.
- ☐ c. Finite Automaton.
- ☐ d. Halting TM.

Your answer is correct.
The correct answer is: DPDA.

Question 19
Correct
Mark 2.00
out of 2.00

Consider the following finite state machine A :



Choose the correct modifications so that A becomes a DFA and $L(A) = \{ w \in \{a,b\}^* \mid w \text{ starts with a and has exactly two a's} \}$.

Select one:

- ☐ a. Replace α by 'b' and β by 'a' and make S starting state and R accept state.
- ☒ b. Replace α by 'b' and β by 'a' and make Q starting state and S accept state. ✓
- ☐ c. Replace α by 'a' and β by 'b' and make P starting state and Q accept state.
- ☐ d. Replace α by 'a' and β by 'b' and make S starting state and Q accept state.

Your answer is correct.
The correct answer is: Replace α by 'b' and β by 'a' and make Q starting state and S accept state.

Question 20
Partially correct
Mark 0.67
out of 1.00

Which of the following is/are false?

Select one or more:

- ☐ a. If a language is not Turing recognizable, then none of its subset can be decidable.
- ☐ b. Every infinite subset of a Decidable language may not be decidable.
- ☒ c. No subset of a regular language can be non Turing recognizable. ✓
- ☒ d. The complement of a CFL can not be a CFL. ✓

Your answer is partially correct.
You have correctly selected 2.
The correct answers are: If a language is not Turing recognizable, then none of its subset can be decidable., No subset of a regular language can be non Turing recognizable. , The complement of a CFL can not be a CFL.

Question 21

Correct

Mark 1.00
out of 1.00

Which of the following classes is/are known to be closed under complement but not closed under union and intersection?

Select one or more:

- ☐ a. Regular.
- ☐ b. Turing recognizable.
- ☒ c. DCFL. ✓
- ☐ d. CFL.

Your answer is correct.

The correct answer is: DCFL.

Question 22

Correct

Mark 1.00
out of 1.00

Let L be a language accepted by a DFA with q states. Which of the following statements is/are necessarily true?

Select one or more:

- ☐ a. The number of strings in L is q-1.
- ☐ b. The number of strings in L is q+1.
- ☒ c. There exists a NFA with q or less states which accepts L. ✓
- ☐ d. Every NFA which accepts L requires atleast 2^q states.

Your answer is correct.

The correct answer is: There exists a NFA with q or less states which accepts L.

Question 23

Correct

Mark 1.00
out of 1.00

Consider the following languages A and B,

$A = \{a^i b^j \mid i > j\}$

$B = \{b^k a^l \mid k > l\}$

Which of the following statements is/are true?

Select one or more:

- ☐ a. $A^* \cup B^*$ is a regular language.
- ☒ b. $(A^* \cup B^*)^*$ is a CFL. ✓
- ☒ c. $A \cdot B$ is a CFL. ✓
- ☐ d. $A \cdot B$ is a regular language.

Your answer is correct.

The correct answers are: $(A^* \cup B^*)^*$ is a CFL., $A \cdot B$ is a CFL.

Question 24

Correct

Mark 1.00
out of 1.00

Let $\Sigma = \{a\}$. Consider the following language, $L = \{a^{nk} \mid k > 0, \text{ and } n \text{ is a positive integer constant}\}$.

What is the minimum number of states in a DFA that recognises L?

Select one:

- ☐ a. k+1.
- ☐ b. 2^{k+1} .
- ☐ c. 2^{n+1} .
- ☒ d. n+1. ✓

Your answer is correct.

The correct answer is: n+1.

Question **25**
Correct
Mark 2.00
out of 2.00

For a language A, consider the following,
 $\text{Suffix}(A) = \{ v \mid uv \in A \text{ for some string } u \}$.
Which of the following statements is/are true?

- Select one or more:
- ☒ a. If A is regular, then $\text{Suffix}(A)$ is also regular. ✓
 - ☒ b. If A is a CFL then $\text{Suffix}(A)$ is also a CFL. ✓
 - ☐ c. If A is a CFL then $\text{Suffix}(A)$ may or may not be a CFL.
 - ☐ d. If A is a CFL then $\text{Suffix}(A)$ is not a CFL.

Your answer is correct.
The correct answers are: If A is a CFL then $\text{Suffix}(A)$ is also a CFL., If A is regular, then $\text{Suffix}(A)$ is also regular.

Question **26**
Correct
Mark 2.00
out of 2.00

Consider the following statements :
 L_1 is a regular language.
 L_2 is a CFL.
 L_3 is a decidable language.
 L_4 is a Turing recognizable language.
Which of the following is/are true?

- Select one or more:
- ☐ a. $L_1 \cup L_2'$ is context free. (L_2' is the complement of L_2)
 - ☒ b. $L_3' \cup L_4$ is Turing recognizable. (L_3' is the complement of L_3) ✓
 - ☒ c. $L_2 \cup L_3$ is decidable. ✓
 - ☒ d. $L_1^* \cup L_2$ is context free. ✓

Your answer is correct.
The correct answers are: $L_3' \cup L_4$ is Turing recognizable. (L_3' is the complement of L_3), $L_2 \cup L_3$ is decidable., $L_1^* \cup L_2$ is context free.

Question **27**
Correct
Mark 2.00
out of 2.00

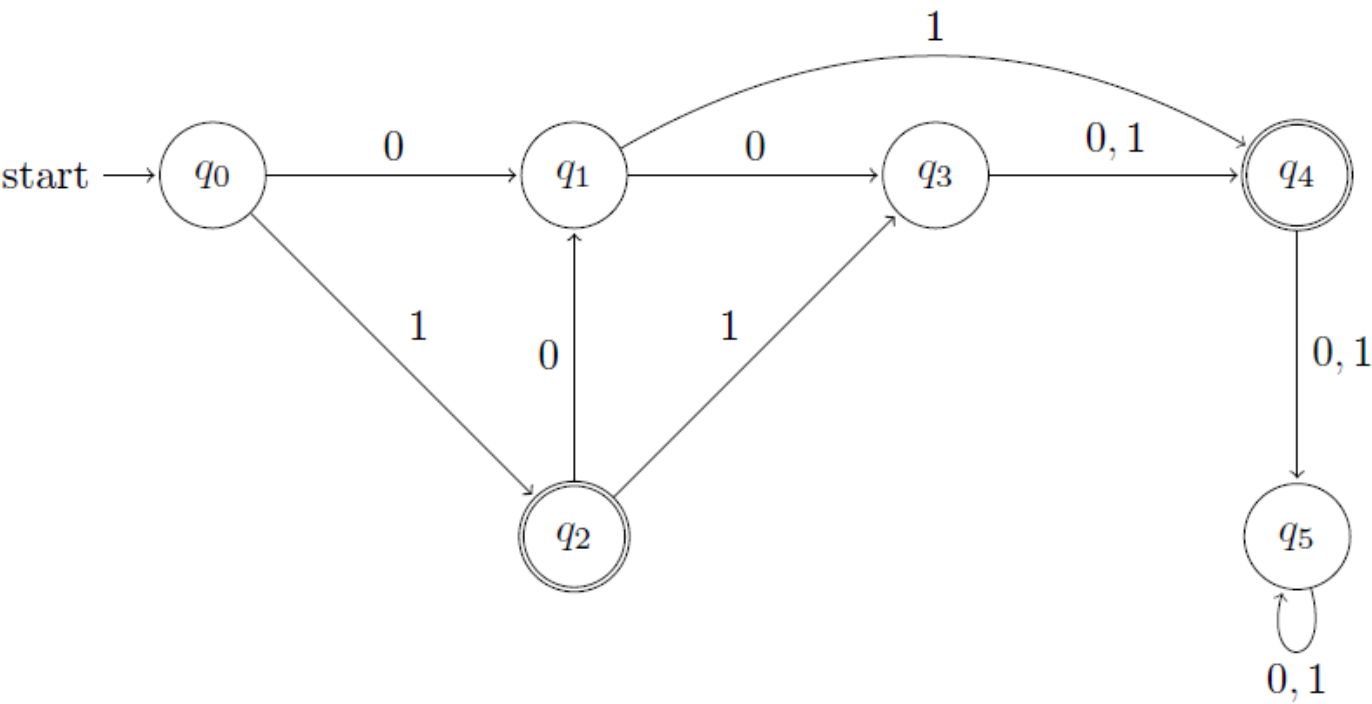
Which of the following language(s) is/are in P?

- Select one or more:
- ☒ a. $L_2 = \{ \langle G \rangle \mid G \text{ is a directed graph that has a cycle} \}$. ✓
 - ☒ b. $L_1 = \{ \langle G \rangle \mid G \text{ is an undirected graph that has a cycle} \}$. ✓
 - ☒ c. $L_3 = \{ \langle G \rangle \mid G \text{ is a undirected graph containing an Eulerian Circuit} \}$. ✓
 - ☐ d. $L_4 = \{ \langle G \rangle \mid G \text{ is a undirected graph containing Hamiltonian Cycle} \}$.

Your answer is correct.
The correct answers are: $L_1 = \{ \langle G \rangle \mid G \text{ is an undirected graph that has a cycle} \}$., $L_2 = \{ \langle G \rangle \mid G \text{ is a directed graph that has a cycle} \}$., $L_3 = \{ \langle G \rangle \mid G \text{ is a undirected graph containing an Eulerian Circuit} \}$.

Question 28
Correct
Mark 2.00
out of 2.00

Cardinality of the language recognized by below DFA is :



Select one:

- ☐ a. Infinite.
- ☒ b. 9. ✓
- ☐ c. 8.
- ☐ d. 10.

Your answer is correct.

The correct answer is: 9.

Question 29
Partially correct
Mark 1.33
out of 2.00

Which of the following languages is/are decidable?

Select one or more:

- ☐ a. $L_3 = \{ \langle M_1, M_2 \rangle \mid M_1 \text{ and } M_2 \text{ are TMs and } L(M_1) \cap L(M_2) = \emptyset \}$.
- ☐ b. $L_1 = \{ \langle G \rangle \mid G \text{ is a CFG and } L(G) \text{ is regular} \}$.
- ☒ c. $L_4 = \{ \langle R, A \rangle \mid R \text{ is a RE and } A \text{ is a DFA and } L(R) = L(A) \}$. ✓
- ☒ d. $L_2 = \{ \langle G \rangle \mid G \text{ is a CFG and } L(G) = \emptyset \}$. ✓

Your answer is partially correct.

You have correctly selected 2.

The correct answers are: $L_1 = \{ \langle G \rangle \mid G \text{ is a CFG and } L(G) \text{ is regular} \}$, $L_2 = \{ \langle G \rangle \mid G \text{ is a CFG and } L(G) = \emptyset \}$, $L_4 = \{ \langle R, A \rangle \mid R \text{ is a RE and } A \text{ is a DFA and } L(R) = L(A) \}$.

Question 30
Correct
Mark 2.00
out of 2.00

Consider the following languages :

$L_1 = \{ 0^p 1^q 0^r 1^s \mid p, q, r, s \geq 0, p=q \text{ or } r=s \}$

$L_2 = \{ 0^p 1^q 0^r 1^s \mid p, q, r, s \geq 0, q=r \text{ or } p=r \}$

Which of the following statements is/are true?

Select one or more:

- ☒ a. $L_2 \cup L_1$ is context free. ✓
- ☐ b. A Turing machine would require a fixed amount of memory to accept L_2 .
- ☒ c. $L_1 \cap L_2$ is context free. ✗
- ☒ d. L_1 is context free. ✓

Your answer is correct.

The correct answers are: L_1 is context free., $L_2 \cup L_1$ is context free.

Question 31

Partially correct

Mark 0.67 out of 1.00

Let L_1 be a regular language, L_2 be a deterministic context free language and L_3 be a Turing recognizable but not decidable language. Which of the following statements is/are true?

Select one or more:

- ☐ a. $L_1 \cap L_2 \cap L_3$ is Turing recognizable.
- ☒ b. $L_3 \cap L_1$ is decidable. ✖
- ☒ c. $L_1 \cap L_2$ is context free. ✔
- ☒ d. $L_1 \cup L_2$ is context free. ✔

Your answer is partially correct.

You have correctly selected 2.

The correct answers are: $L_1 \cap L_2 \cap L_3$ is Turing recognizable., $L_1 \cup L_2$ is context free., $L_1 \cap L_2$ is context free.

Question 32

Correct

Mark 1.00 out of 1.00

For the set of all Turing recognizable languages, which of the following is/are true?

Select one or more:

- ☐ a. Closed under complementation.
- ☐ b. Subset of the set of all decidable languages.
- ☐ c. An uncountable set.
- ☒ d. Closed under intersection. ✔

Your answer is correct.

The correct answer is: Closed under intersection.

Question 33

Correct

Mark 1.00 out of 1.00

Consider the following language:

$$L = \{\underbrace{111 \dots 11}_{n \text{ times}} \mid n \text{ is a perfect square}\}$$

Then which of the following is/are true?

Select one or more:

- ☒ a. L is decidable. ✔
- ☒ b. $L \in \text{NP}$. ✔
- ☐ c. L is regular.
- ☐ d. L is not decidable.

Your answer is correct.

The correct answers are: L is decidable., $L \in \text{NP}$.

Question 34

Correct

Mark 1.00 out of 1.00

Let P , Q and R be regular expressions such that the number of strings generated by P is p , Q is q and R is r . What is the number of strings generated by the regular expression $(P + R)^*Q + PQ$?

Select one:

- ☐ a. $2^{(p+r)}q + pq$
- ☐ b. $(p + r)q + pq$
- ☒ c. Infinite ✔
- ☐ d. $(2^{pq} + q)(p + q)$

Your answer is correct.

The correct answer is: Infinite

Question **35**
Correct
Mark 2.00
out of 2.00

Let L_1 be a decidable language. Let L_2 and L_3 be languages that are Turing recognizable but not decidable. Which of the following statements is/are true?

Select one or more:

- ☐ a. $L_1 - L_3$ is Turing recognizable.
- ☒ b. $L_2 \cup L_1$ is Turing recognizable. ✖
- ☒ c. $L_2 \cap L_1$ is Turing recognizable. ✔
- ☒ d. $L_2 - L_1$ is Turing recognizable. ✔

Your answer is correct.

The correct answers are: $L_2 - L_1$ is Turing recognizable., $L_2 \cap L_1$ is Turing recognizable.

Question **36**
Correct
Mark 1.00
out of 1.00

Consider the following languages

$L_1 = \{0^p 1^q 0^r \mid p, q, r \geq 0, p = q\}$

$L_2 = \{0^p 1^q 0^r 1^s \mid p, q, r, s \geq 0, q = r\}$

Which of the following statements is/are true?

Select one or more:

- ☐ a. $L_1 \cap L_2$ is context free.
- ☒ b. L_1 is context free. ✔
- ☒ c. L_2 is context free but not regular. ✔
- ☒ d. $L_2 \cup L_1$ is deterministic context free. ✖

Your answer is correct.

The correct answers are: L_1 is context free., L_2 is context free but not regular.

Question **37**
Correct
Mark 1.00
out of 1.00

Which of the following statements is/are true?

Select one or more:

- ☒ a. Turing recognizable languages are closed under intersection. ✔
- ☐ b. Turing recognizable languages are closed under union and complementation.
- ☒ c. Decidable languages are closed under intersection and complementation. ✔
- ☒ d. For every non-deterministic Turing machine, there exists an equivalent deterministic Turing machine. ✔

Your answer is correct.

The correct answers are: For every non-deterministic Turing machine, there exists an equivalent deterministic Turing machine., Decidable languages are closed under intersection and complementation., Turing recognizable languages are closed under intersection.

Question **38**
Partially correct
Mark 0.50
out of 1.00

Which of the following statements is/are true?

Select one or more:

- ☐ a. RE languages are not closed under complement.
- ☐ b. CFLs are closed under concatenation and complement and not closed under reverse and intersection.
- ☒ c. Every DPDA can be converted to a context free grammar. ✔
- ☐ d. Every context free grammar can be converted to a DPDA.

Your answer is partially correct.

You have correctly selected 1.

The correct answers are: Every DPDA can be converted to a context free grammar., RE languages are not closed under complement.

Question 39

Partially correct

Mark 0.50 out of 1.00

Let L_0 be a language such that $L_0 \in \text{NP-complete}$. Which of the following statements is/are true?

Select one or more:

- ☒ a. $L_0 \in \text{NP}$. ✓
- ☐ b. For all L in P , $L \leq_p L_0$.
- ☐ c. Let L be a language in the class P and $L_0 \leq_p L$.
- ☐ d. For all L in NP , $L_0 \leq_p L$.

Your answer is partially correct.

You have correctly selected 1.

The correct answers are: $L_0 \in \text{NP}$., For all L in P , $L \leq_p L_0$.

Question 40

Correct

Mark 2.00 out of 2.00

Consider the following languages :

$$L_1 = \{a^{3n} \mid n \geq 1\}$$
$$L_2 = \{w\overline{w} \mid w \in \{0,1\}^* \text{ and } \overline{w} \text{ is obtained by flipping the bits at the odd positions of } w\}$$
$$L_3 = \{a^{n!} \mid n \geq 1\}$$
$$L_4 = \{a^{n^2} \mid n \geq 1\}$$

Which of the above languages is/are non-regular?

Select one or more:

- ☒ a. L_3 . ✓
- ☒ b. L_4 . ✓
- ☐ c. L_1 .
- ☒ d. L_2 . ✓

Your answer is correct.

The correct answers are: L_2 ., L_3 ., L_4 .

◀ Quiz 2

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