CSE 105 HW 4

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Question 1.

(a) **Answer:**

(b) **Answer:**

(c) **Answer:**

(d) **Answer:**

Question 2.

(a) **Answer:** We can define the following context-free grammar for $\text{REP}(0^n1^n \mid n \geq 0)$:

$$S \to \epsilon \mid 2AS2$$
$$A \to 0A1 \mid \epsilon$$

Intuitively, S generates all strings in $\text{REP}(0^n1^n \mid n \geq 0)$ by allowing the production of the empty string or strings that begin and end with 2 and have a sequence of 0s and 1s in between. The A nonterminal generates any valid sequence of 0s and 1s. $w = \epsilon$

$$S \Rightarrow \epsilon$$

(b) **Answer:**

Question 3.

(a) **Answer:**

(b) **Answer:**

(c) **Answer:**