Math 142B
August 7, 2018

Question 1 A partition P of an interval $[a, b]$ is

A. a finite set of points contained in $[a, b]$.

B. a subinterval of $[a, b]$.

C. a finite collection of subintervals of $[a, b]$ whose union is $[a, b]$.

*D. **A** and, in addition, $\{a, b\} \subseteq P$.

E. None of the above.

Question 2 Given P a partition of $[a, b]$. P^* is a refinement of P if

A. P^* has more partition intervals than P.

B. P^* is also a partition of $[a, b]$.

C. $P^* \supseteq P$.

D. **A** and **B**.

*E. **B** and **C**.

Question 3 Consider the open interval $I = (1, 10)$ and the finite set $P = \{1, 3, 6, 7, 10\}$.

A. P is a partition of I.

B. P is a partition of $I \cup \{1, 10\}$.

C. I doesn't have any partitions.

*D. **B** and **C**.

E. None of the above.

Question 4 $P = \{1, 3/2, 5/2, 4\}$ is a partition of $[1, 4]$ with partition intervals $I_1 = [1, 3/2], I_2 = [3/2, 5/2], I_3 = [5/2, 4]$.
$P^* = \{1, 3/2, 2, 5/2, 3, 7/2, 4\}$ is a refinement of P with
$P_1 = \{1, 3/2\}, P_2 = \{3/2, 2, 5/2\}, P_3 = \{5/2, 3, 7/2, 4\}$.

A. $P^* = P_1 \cup P_2 \cup P_3$.

B. P_i is a partition of I_i for each index $i = 1, 2, 3$.

C. $\text{gap}(P^*) < \text{gap}(P)$.

D. **A** and **B**.

*E. **A**, **B**, and **C**.

Question 5 Given $f : [a, b] \to \mathbb{R}$ bounded and $P \subseteq P^*$ partitions of $[a, b]$.

A. P^* is a refinement of P.

B. $L(f, P^*) = L(f, P)$ and $U(f, P^*) = U(f, P)$.

C. $L(f, P^*) \geq L(f, P)$ and $U(f, P^*) \leq U(f, P)$.

D. **A** and **B**.

*E. **A** and **C**.