1. In the weighted voting system \([34 : 10, 7, 4, 4, 3, 3, 1, 1]\) how many players are there?
   A) 9

2. In the weighted voting system \([34 : 10, 7, 4, 4, 3, 3, 1, 1]\) what is the quota?
   C) 34

3. In the system \([34 : 10, 7, 4, 4, 3, 3, 1, 1]\) what is the total number of votes?
   D) 36

4. In the weighted voting system \([9 : 11, 4, 2]\) which of these is true?
   C) \(P_1\) is a dictator.

5. In the weighted voting system \([14 : 7, 7, 6]\) which of these is true?
   B) \(P_1\) and \(P_2\) have equal power, \(P_3\) is a dummy.

6. In the weighted voting system \([10 : 5, 4, 2]\) which of these is true?
   D) Every player has veto power.

7. In the weighted voting system \([q : 10, 8, 6]\) a strict majority of the votes is needed for a motion to pass. What is the value of the quota \(q\)?
   A) 13

8. In the weighted voting system \([q : 20, 19, 16, 2, 1, 1]\) a two-thirds majority of the votes is needed for a motion to pass. What is the value of the quota \(q\)?
   D) 40

9. In the weighted voting system \([q : 12, 10, 5, 1, 1]\) what is the smallest possible value of the quota \(q\)?
   B) 15

10. In the weighted voting system \([30 : 24, 12, 8, 4, 2]\) what is the minimum percentage of votes needed to pass a motion?
    D) 60
Weighted Voting Quiz 2 - Answers
Use the Banzhaf power definitions to answer the questions about the given weighted voting systems. Denote the players by $P_1, P_2, \text{ etc.}$

1. In $[35 : 32, 15, 10, 3]$ what is the weight of the coalition $\{P_2, P_3, P_4\}$?
   A) 28

2. In $[35 : 32, 15, 10, 3]$ what are the winning coalitions?
   A) All coalitions with two or more players, one of which is $P_1$.

3. In $[35 : 32, 15, 10, 3]$ what is the number of winning coalitions?
   A) 7

4. In $[35 : 32, 15, 10, 3]$ which of the players in the coalition $\{P_1, P_3\}$ is critical?
   A) $P_1$ and $P_3$

5. In $[35 : 32, 15, 10, 3]$ which of the players in the coalition $\{P_1, P_3, P_4\}$ is critical?
   D) $P_1$ only.

6. In $[35 : 32, 15, 10, 3]$ what is the Banzhaf power distribution of the players?
   A) $P_1 : 70\%, \ P_2 : 10\%, \ P_3 : 10\%, \ P_4 : 10\%$.

7. In $[12 : 5, 5, 2, 2]$ what is the weight of the coalition $\{P_2, P_3, P_4\}$?
   D) 9

8. In $[12 : 5, 5, 2, 2]$ which of the players in the coalition $\{P_1, P_2, P_3, P_4\}$ is critical?
   C) $P_1$ and $P_2$ only

9. In $[12 : 5, 5, 2, 2]$ what is the total number of winning coalitions?
   A) 3

10. In $[12 : 5, 5, 2, 2]$ what is the Banzhaf power distribution of the players?
    C) $P_1 : 37.5\%, \ P_2 : 37.5\%, \ P_3 : 12.5\%, \ P_4 : 12.5\%$. 
1. In \([25 : 16, 8, 6, 3]\) what is the weight of the coalition \(\{P_1, P_2, P_3, P_4\}\)?
   A) 33

2. In \([25 : 16, 8, 6, 3]\) which players are critical in the coalition \(\{P_1, P_3, P_4\}\)?
   B) All three players.

3. In \([25 : 16, 8, 6, 3]\) which players are critical in the coalition \(\{P_1, P_2, P_3, P_4\}\)?
   A) Only \(P_1\).

4. In \([25 : 16, 8, 6, 3]\) which players have veto power?
   A) Only \(P_1\).

5. In \([25 : 16, 8, 6, 3]\) what are the winning coalitions?
   D) All coalitions with three or more players, one of which is \(P_1\).

6. In \([25 : 16, 8, 6, 3]\) what is the number of winning coalitions?
   A) 4

7. In \([25 : 16, 8, 6, 3]\) what is the Banzhaf power distribution of the players?
   A) \(P_1 : 40\%, P_2 : 20\%, P_3 : 20\%, P_4 : 20\%\).

8. In the generic weighted voting system \([q : w_1, w_2, \cdots, w_N]\) which of the following is mathematically equivalent to the statement that \(P_1\) is a dictator?
   A) \(w_1 > q\)

9. In the generic weighted voting system \([q : w_1, w_2, \cdots, w_N]\) which of the following is mathematically equivalent to the statement that \(P_1\) has veto power?
   C) \(w_2 + \cdots + w_N < q\) and \(w_1 < q\)

10. In the generic weighted voting system \([q : w_1, w_2, w_3, w_4, w_5]\) suppose that the winning coalitions are exactly those having 3 or more players. Which of the players are critical in the coalition \(\{P_1, P_2, P_4, P_5\}\)
    D) None of the players.