

Physics 3410 Quiz 3

Please write the letter of the correct answer in the box provided.

Name: _____

☐ 1. How many ways can I choose a gold, silver, and bronze medalist out of 10 athletes?
A) 10! **B) 10!/3!** **C) 10!/7!** **D) 10!/(3!7!)**

☐ 2. If N is a large number, find the simplest approximation of $3(N+2)2^N$.
A) 2^N **B) $N 2^N$** **C) $3N 2^N$** **D) $(N+2) 2^N$**

☐ 3. How many energy macrostates does a paramagnet with $N=4$ dipoles in a B field have?
A) 5 **B) 16** **C) $4!=24$**

☐ 4. What is the normalized energy U of this paramagnet?
A) 1 **B) 2** **C) 3** **D) 4** **E) 5** **F) 32**



☐ 5. For the Einstein solid pictured, what is q ?
A) 1 **B) 3** **C) 4** **D) 6** **E) 16**



☐ 6. What is the multiplicity of an Einstein solid with N oscillators and q quanta of energy?
A) $\binom{N}{q}$ **B) $\binom{N+q}{q}$** **C) $\binom{N+q-1}{q-1}$** **D) $\binom{N+q-1}{q}$**

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C 1. How many ways can I choose a gold, silver, and bronze medalist out of 10 athletes?
 A) $10!$ B) $10!/3!$ C) $10!/7!$ D) $10!/(3!7!)$

A 2. If N is a large number, find the simplest approximation of $3(N+2)2^N$.
 A) 2^N B) $N 2^N$ C) $3N 2^N$ D) $(N+2) 2^N$

A 3. How many energy macrostates does a paramagnet with $N=4$ dipoles in a B field have?
 A) 5 B) 16 C) $4!=24$

C 4. What is the normalized energy U of this paramagnet?
 A) 1 B) 2 C) 3 D) 4 E) 5 F) 32



D 5. For the Einstein solid pictured, what is q ?
 A) 1 B) 3 C) 4 D) 6 E) 16



D 6. What is the multiplicity of an Einstein solid with N oscillators and q quanta of energy?
 A) $\binom{N}{q}$ B) $\binom{N+q}{q}$ C) $\binom{N+q-1}{q-1}$ D) $\binom{N+q-1}{q}$