Unit 11 - Week 6

Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-11, 23:59 IST.

1) ______ can provide a connection between macroscopic and microscopic behaviour of matter. *2 points*

- Quantum mechanics
- Statistical Mechanics
- Classical mechanics
- All the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
Statistical Mechanics

2) What is the total number of ways a quantum system somprising of a particle in a box, can achieve an energy (E^*) be $\frac{6h^2}{8mL^2}$? *2 points*

- 1
- 2
- 3
- 4

No, the answer is incorrect.
Score: 0
Accepted Answers:
3

3) Whenever we are dealing with the problems in quantum mechanics which of the following equations is generally solved? *2 points*

- $F = ma$
- $E = mc^2$
- $H\Psi = E\Psi$
- All of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
$H\Psi = E\Psi$

4) For an isolated system, every microstate is equally probable. *2 points*

- True
- False

No, the answer is incorrect.
Score: 0
Accepted Answers:
True

5) In classical thermodynamics, which of the following is/are necessary to derive the thermodynamic properties of a system? *2 points*

- Energy of all particles
- Momenta of all particles
- Positions of all particles
- All of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
Momenta of all particles
Positions of all particles

6) There are many number of ways the particles inside a system can distribute themselves, so that a ______ of the system can be achieved. Each of those ways is called ____ *2 points*

- microstate and microstate
- microstate and macrostate
- macrostate and macrostate
- macrostate and microstate

No, the answer is incorrect.
Score: 0
Accepted Answers:
macrostate and microstate

7) For a single particle in a system, the number of possible states less than a given energy E , is *2 points*

- $\frac{3\pi}{4}\left(\frac{EmV^{\frac{2}{3}}}{h^2}\right)^{\frac{3}{2}}$
- $\frac{4\pi}{3}\left(\frac{8EmV^{\frac{2}{3}}}{h^2}\right)^{\frac{3}{2}}$
- $\frac{\pi}{6}\left(\frac{8EmV^{\frac{2}{3}}}{h^2}\right)^{\frac{3}{2}}$
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{\pi}{6}\left(\frac{8EmV^{\frac{2}{3}}}{h^2}\right)^{\frac{3}{2}}$

8) For a single particle quantum system, the number of microstates it can have when its energy is around a specific value E^* is very small. *2 points*

- True
- False

No, the answer is incorrect.
Score: 0
Accepted Answers:
False

9) Classical treatment of Statistical Mechanics refers to ________ *2 points*

- an old way of treating the mechanics of the system
- using Newton's laws to treat atomistic nature of matter
- a more modern way of treating solids
- associating statistics and mechanics

No, the answer is incorrect.
Score: 0
Accepted Answers:
using Newton's laws to treat atomistic nature of matter

10) When the following expression is evaluated, *0 points*

$$\bar{\mathcal{A}} = \lim_{t_{obs}\to\infty} \frac{1}{t_{obs}} \int_0^{t_{obs}} \mathcal{A}(P(\tau), q(\tau))d\tau$$

- $\mathcal{A}$ is a function of time
- $\mathcal{A}$ is a constant
- $\mathcal{A}$ cannot be evaluated
- $\mathcal{A}$ is a function of position and momenta of all particles

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\mathcal{A}$ *is a constant*