Assignment 0

The due date for submitting this assignment has passed. Due on 2018-02-04, 23:59 IST.

Submitted assignment

1) A three-digit number (that is, a number from 100-999), is selected “at random” (“at random” means that we assume that all numbers to have the same probability of being selected). What is the probability that all three digits are the same? 1 point

- (a) 8/100
- (b) 9/100
- (c) 7/100
- (d) 1/100

No, the answer is incorrect.
Score: 0
Accepted Answers:
(d) 1/100

2) How many ways a cricket team of 11 members can be selected out of 15 members – 1 point

- (a) 1465
- (b) 3794
- (c) 1365
- (d) 656

No, the answer is incorrect.
Score: 0
Accepted Answers:
(c) 1365

3) A club consists of 50 members. i) In how many ways can a president, vice-president, secretary and treasurer be chosen? ii) In how many ways can a committee of 4 members be chosen? 1 point

- (a) For i) \(50P_4\), for ii) \(50C_4\)
- (b) For i) \(50C_4\), for ii) \(50P_4\)
- (c) For i) \(50C_4\), for ii) \(50C_4\)
- (d) For i) \(50P_4\), for ii) \(50C_4\)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a) For i) \(50P_4\), for ii) \(50C_4\)
NOTE: This is the plot of

\[ y = a e^{-\frac{(x-b)^2}{2\sigma^2}} \]  .... Eq 1

This function is also famously known as ‘Gaussian Function’.

Where, \( a \) = height of the peak.

\( b \) = position of the highest peak and also mean.

\( \sigma \) = defines spread of the function; at \( y = a/2 \) the half-spread is \( \sigma \sqrt{\ln 4} \).

![Graph of Gaussian functions](image)

4) In Fig: 1 three different Gaussian functions are shown. One of the variables among \( a \), \( b \) and \( \sigma \) is different for these three different Gaussian functions. The variable that is different for these three different Gaussians is -

- (a) \( a \)
- (b) \( b \)
- (c) \( \sigma \)
- (d) None

No, the answer is incorrect.
Score: 0
Accepted Answers: (c) \( \sigma \)

5) The parameter which varies in the above case has the following descending order –

- (a) 1 > 2 > 3
- (b) 2 > 1 > 3
- (c) 3 > 2 > 1
- (d) 3 > 1 > 2

No, the answer is incorrect.
Score: 0
Accepted Answers: (c) 3 > 2 > 1

6) Among volume(V), temperature(T), pressure(P), number of particles(N) and internal energy(U), the intensive properties of a system are –

- (a) V, T
- (b) U, N
- (c) T, U
- (d) T, P

No, the answer is incorrect.
Score: 0
Accepted Answers: (d) T, P

7) What are the names given to a) constant temperature, b) constant pressure, c) constant volume and d) constant entropy processes, respectively –

- (a) Isothermal, isochoric, isobaric, adiabatic.
- (b) Isothermal, isobaric, isochoric, adiabatic.
- (c) Isochoric, isobaric, isothermal, adiabatic.
- (d) Adiabatic, isochoric, isobaric, isothermal.

Score: 0
8) Two systems (system A and System B) are in thermal equilibrium, means –
   (a) There is no net exchange of particles with time from system A to B.
   (b) There is no net exchange of energy with time from system A to B.
   (c) There is no net exchange of volume with time from system A to B.
   (d) There is no net exchange of pressure with time from system A to B.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (b) Isothermal, isobaric, isochoric, adiabatic.

9) When does a real gas behave like an ideal gas –
   (a) At low T and high P.
   (b) At low P and high T.
   (c) At high P only.
   (d) At low T only.

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (b) There is no net exchange of energy with time from system A to B.

10) For a mole of an ideal gas, $C_p$ and $C_v$ represent molar heat capacities of the gas at constant pressure and constant volume respectively. What is ($C_p - C_v$) for this system?
   (a) $R$
   (b) $2R$
   (c) $0.5R$
   (d) $3R$

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) $R$