X

NPTEL

reviewer3@nptel.iitm.ac.in ▾

Courses » Phase field modelling: the materials science, mathematics and computational aspects

Announcements **Course** Ask a Question Progress Mentor FAQ

Unit 4 - Week 3

Course outline

Assignment 3

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

Due on 2018-09-05, 23:59 IST.

1) If we assume a solution of type $c = c_0 + A(\beta, t)exp(i\beta x)$ for the classical diffusion equation, then its substitution in the diffusion equation will result in the following equation: ***1 point***

- $\frac{\partial A}{\partial t} = iD\beta A$
- $\frac{\partial A}{\partial t} = +D\beta^2 A$
- $\frac{dA}{dt} = -D\beta^2 A$
- $\frac{dA}{dt} = D\beta^2 A$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{dA}{dt} = -D\beta^2 A$

2) Matano interface is an interface defined in such a way that: ***1 point***

- flux of one type of atom is zero w.r.t the interface.
- net composition difference is equal to zero.
- net flux with respect to the interface is equal to zero.
- net flux with respect to the interface is maximum.

No, the answer is incorrect.
Score: 0

Accepted Answers:

$n = 17;$
$lognfact = n * ln(n) - n;$
$disp(lognfact);$

$n = 17;$
$lognfact = n * log(n) - n^2;$
$disp(lognfact);$

$n = 17;$
$lognfact = n * log(n) - n;$
$disp(lognfact);$

$n = 17;$
$lognfact = n * ln(n) + n;$
$disp(lognfact);$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$n = 17;$
$lognfact = n * log(n) - n;$
$disp(lognfact);$

4) The expression for mobility (M) in terms of diffusivity (D) is (where G" is $\frac{d^2G}{dc^2}$ and N_v is the number of atoms per unit volume): ***1 point***

$M = \frac{DG"}{N_V}$

$M = \frac{DN_v}{G"}$

$M = -\frac{DN_v}{G"}$

$M = -\frac{DG"}{N_v}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$M = \frac{DN_v}{G"}$

5) The mobility (M) in terms of compositions $(c, 1-c)$ and velocities (v_1, v_2) of atoms in a binary system is: ***1 point***

$M = c(1-c)\{(1-c)v_2 + cv_1\}$

$M = -c(1-c)\{(1-c)v_1 + cv_2\}$

$M = c(1-c)\{(1-c)v_1 + cv_2\}$

$M = c(1-c)\{(1-c)^2 v_2 + c^2 v_1\}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$M = c(1-c)\{(1-c)v_2 + cv_1\}$

6) In GNU Octave, what does the following line of code return as output? *1 point*

```
logspace(3,4,100)
```

$log_3 100$ and $log_4 100$.

a row vector that gives 100 elements logarithmically spaced between 3 and 4.

a row vector that gives 100 elements logarithmically spaced between 10^3 and 10^4.

None of the above.

No, the answer is incorrect.
Score: 0

Accepted Answers:
a row vector that gives 100 elements logarithmically spaced between 10^3 *and* 10^4.

7) There exists a lower limit to the wavelength of the composition fluctuation when a system undergoes spinodal decomposition because of: *1 point*

Gibbs free energy.

Interfacial free energy.

Bulk free energy.

All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Interfacial free energy.

8) Interfacial free energy of a system is *1 point*

zero.

Always negative.

Always positive.

Either positive or negative.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Always positive.

9) Which of the following is the Cahn-Hilliard equation? *1 point*
(κ denotes the gradient energy term, all other symbols have usual meaning)

$\frac{\partial c}{\partial t} = \frac{M}{N_v}\left[G" \frac{\partial c}{\partial x} - 2\kappa \frac{\partial^2 c}{\partial x^2}\right]$

$$\frac{\partial c}{\partial t} = \frac{M}{N_v}\left[G"\frac{\partial^2 c}{\partial x^2} - 2\kappa\frac{\partial^4 c}{\partial x^4}\right]$$

$$\frac{\partial c}{\partial t} = \frac{M}{N_v}\left[G"\frac{\partial c}{\partial x} + 2\kappa\frac{\partial^2 c}{\partial x^2}\right]$$

$$\frac{\partial c}{\partial t} = \frac{M}{N_v}\left[G"\frac{\partial^2 c}{\partial x^2}\right]$$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$$\frac{\partial c}{\partial t} = \frac{M}{N_v}\left[G"\frac{\partial^2 c}{\partial x^2} - 2\kappa\frac{\partial^4 c}{\partial x^4}\right]$$

Previous Page

End