Assignment-1

1) Gibbs phase rule for general system is: ***1 point***

- P+F=C-1
- P+F=C+1
- P+F=C-2
- P+F=C+2

Accepted Answers:
P+F=C+2

2) In which of the following condition, energy is continuously dissipating ? ***1 point***

- Unstable equilibrium
- Unstable
- Stable equilibrium
- Metastable equilibrium

Accepted Answers:
Unstable

3) Free energy vs composition curve of a solution is _____ in nature. ***1 point***

- Straight line
- Parabolic
- Hyperbolic
- Elliptical
- Circular

Accepted Answers:
Parabolic

4) $\Delta S_{config} = k \ln W$ is known as ***1 point***

- Roults equation
- Newton equation
- Boltzman equation
- None of these

Accepted Answers:
Boltzman equation

5) What kind of approximation is used to solve the equation in question 4 ? ***1 point***

- Sterling approximation
- Taylor approximation
- Function approximation
- None of these

Accepted Answers:
Sterling approximation

6) Tangent to the G vs X curve gives us: ***1 point***

- Chemical potential
- Enthalpy
- Configuration entropy
- Activity

Accepted Answers:
Chemical potential

7) Second derivative of G vs T curve is: ***1 point***

- Zero
- Positive
- Negative
- Cannot be defined

Accepted Answers:
Negative

8) Which one of the following equation is correct ? ***1 point***

- G=U+TS
- G=U-TS
- G=H+TS
- G=H-TS

Accepted Answers:
G=H-TS

9) A system is said to be at equilibrium, if entropy of system has reached _____ value. ***1 point***

- Zero
- Maximum
- Minimum
- Cannot be defined

Accepted Answers:

Maximum

10) The point at which all three states (solid, liquid, gas) coexist is known as _____ point. **1 point**

- Freezing
- Boyle
- Boiling
- Triple
- None of these

Accepted Answers:
Triple

11) The specific heat of a hypothetical solid above 300 K is given by Cp = 22.64 + 6.28 × 10-3 T J mol-1 K-1. By how much the entropy increase on heating from 300 K to 1246 K ? **1 point**

- 40.86 J mol-1 K-1
- 15.87 J mol-1 K-1
- 65.41 J mol-1 K-1
- 38.178J mol-1 K-1

Accepted Answers:
38.178J mol-1 K-1

12) If the forward and backward reaction rates are same, then it is known as _____ equilibrium. **1 point**

- Thermal
- Mechanical
- Chemical
- None of these

Accepted Answers:
Chemical

13) Cementite in Iron-Carbon phase diagram has _____ structure. **1 point**

- Orthorhombic
- Monoclinic
- Hexagonal
- Triclinic
- Tetrahedral

Accepted Answers:
Orthorhombic

14) Pick the odd one in the following: **1 point**

- Isomorphous alloy
- Terminal solid solution
- Intermediate solid solution
- Compound

Accepted Answers:

Isomorphous alloy

15) Following is wrong about a phase diagram. **1 point**

- It indicates the temperature at which different phases start to melt.
- Solid solubility limits are depicted by it.
- Relative amount of different phases can be found under equilibrium conditions.
- It gives information about transformation rates.

Accepted Answers:
It gives information about transformation rates.

16) Austenite to pearlite in Fe-C phase diagram is _____ type of transformation. **1 point**

- Eutectic
- Eutectoid
- Peritectic
- Peritectoid
- Monotectic

Accepted Answers:
Eutectoid

17) What is the degree of freedon(F) at invarient point in binary phase diagram? **1 point**

- 4
- 3
- 0
- 2
- 1

Accepted Answers:
0

18) Ability to react in a system is called _____. **1 point**

- Internal energy
- Gibbs free energy
- Chemical potential
- Enthalpy
- Entropy of mixing

Accepted Answers:
Chemical potential

19) Which of the following is correct ? **1 point**

- A phase is chemically homogeneous, physically distinct and mechanically separable.
- A phase is chemically non-homogeneous, physically indistinct and mechanically separable.
- A phase is chemically homogeneous, physically indistinct and mechanically separable.
- A phase is chemically non-homogeneous, physically distinct and mechanically inseparable.
- None of these

Accepted Answers:

A phase is chemically homogeneous, physically distinct and mechanically separable.

20 $G = G_A^0(1-x) + G_B^0 x$ is valid for? **1 point**

- Atomic solutions
- Mechanical mixtures
- Compounds
- None of these

Accepted Answers:
Mechanical mixtures

21 $G = G_A^0(1-x) + G_B^0 x$ is valid for? **1 point**

- Atomic solutions
- Mechanical mixtures
- Compounds
- None of these

Accepted Answers:
Mechanical mixtures

22) Number of octahedral and tetrahedral voids per unit cell in FCC are _____ and _____ respectively. **1 point**

- 4,8
- 8,4
- 4,6
- 8,6
- 4,4

Accepted Answers:
4,8