

Course No: ENGI 1220
Course Title: Introduction of
Materials Science for
Engineering
Date: 14/03/2019
No. of Questions: (4)
Time: 1 hours
Using Calculator (yes)

University of Palestine



1st Mid Term Exam
2nd Semester 2018/2019
Total Grade: 60

Instructor Name: Ph. D. Hossam Ali
ELAQRA
Student No.: _____
Student Name: _____
College Name: Engineering
Dep. / Specialist: _____
Using Dictionary (No)

Question One:

20 marks.

Which of these sentences are true and which is false and correct the false one?

- 1- Electron position based on probability distribution in Bohr atomic model. ()
- 2- Electron revolves around nucleus in continuous orbital in Bohr atomic model. ()
- 3- More electrons in the outer shell less electronegativity of the element. ()
- 4- The viscosity of ideal rheology remains constant then suddenly reaches high value. ()
- 5- The viscosity of poor rheology increases gradually to achieve high value. ()
- 6- Atomic Packing Factor (APF) is the Volume of unit cell / Volume of atoms in unit cell. ()
- 7- The unit cell is the smallest repeated unit in the structure. ()
- 8- Ceramic structure is usually crystal and some amorphous. ()
- 9- Van Der Waals bond are created by dipoles and can be created between atoms or molecules. ()
- 10- Bronze was the first alloy made by the human. ()
- 11- Electrons in the ground state (GS) have higher energy than electron in outer shell. ()
- 12- Ceramics are formed by covalent and secondary bonds. ()
- 13- Polymers are formed by ionic and covalent bonds. ()
- 14- Ionic bond is formed between positive core and negative ions. ()
- 15- Ionic bond is created by sharing electrons between atoms. ()
- 16- CH₄ is an example for ionic bond. ()
- 17- Ceramics are poor conductor for heat and electricity due to the presence of a lot of free electrons. ()
- 18- Polymers are good conductor for heat and electricity due to the presence of a lot of free electrons. ()
- 19- Van Der Waals bond can be created between atoms or molecules. ()
- 20- Van Der Waals bond are created by dipoles. ()

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Question Two:

20 marks.

Choose the correction answer:

- 1- Metals material has the following properties:
 - A- Very strong
 - B- A ductile behavior
 - C- Opaque
 - D- High Thermal conductivity
 - E- Low electrical conductivity

- 2- Polymers material has the following properties:
 - A- Very strong
 - B- A ductile behavior
 - C- High Thermal conductivity
 - D- Low electrical conductivity

- 3- Ceramic material has the following properties:
 - A- Very strong
 - B- A ductile behavior
 - C- High thermal conductivity
 - D- Low electrical conductivity

- 4- Simple cubic structure has:
 - A- One atom in the unit cell
 - B- 2 atoms in the unit cell
 - C- 4 atoms in the unit cell

- 5- Body centered cubic structure has:
 - A- One atom in the unit cell
 - B- 2 atoms in the unit cell
 - C- 4 atoms in the unit cell

- 6- Face cubic structure has:
 - A- One atom in the unit cell
 - B- 2 atoms in the unit cell
 - C- 4 atoms in the unit cell

- 7- The most significant in the human civilization is:
 - A- Discovery of fire
 - B- Contain the fire

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8- The first materials used by the human is:

- A- Polymer
- B- Ceramic
- C- Metal and alloy

9- The first alloy used by the human was:

- A- Stainless steel
- B- Bronze
- C- Gold

10- Man-made materials are:

- A- Wood
- B- Alloys
- C- Skin
- D- Ceramic

11- Electron configuration is composed from:

- A- Ground state
- B- Valence state

12- Primary Bonds are:

- A- Ionic
- B- Van Der Waals
- C- Covalent
- D- Hydrogen

13- Secondary Bonds are:

- A- Ionic
- B- Van Der Waals
- C- Covalent
- D- Hydrogen

14- Hydrogen Bonds are created between H and:

- A- N
- B- F
- C- Cl
- D- O

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15- Diamond are composed from carbon atoms by:

- a- Covalent bond
- b- Ionic bond
- c- Van Der Waals bond
- d- Metallic bond

16- Polymers are formed by:

- a- Secondary bond and covalent
- b- Ionic bond and covalent
- c- Ionic and covalent

17- Ionic and Van Der Waals bond are created by:

- a- Attraction between ions
- b- Attraction opposite charges
- c- Attraction between dipoles
- d- Attraction between core and see of electrons

18- Covalent bond:

- a- Are bad or poor conductor for heat and electricity
- b- Have high bond energy
- c- Have high melting point


19- Secondary bonds:

- a- Are generally liquid or gaze
- b- Are solid
- c- Have low energy bond

20- Ionic and metallic bond are created by:

- e- Attraction between ions
- f- Attraction opposite charges
- g- Attraction between dipoles
- h- Attraction between core and see of electrons

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Question Three:

10 marks.

1- Using the following table, calculate the covalent and ionic fraction:

Fe	Al	Mg	O	Si	C	Na	Cl	F	N	H
1.83	1.61	1.31	3.44	1.9	2.55	0.93	3.16	3.98	3.04	2.2

Al_2O_3

(3 marks)

FeO

(3 marks)

Without calculation which of these compound has more tendency to form Ionic bond than covalent bond.

(4 marks)

NaCl and CH_4

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Question Four:

10 marks.

- 1- Calculate the APF for SC crystal structure? 4 marks. If you know the crystal structure, the atomic radius and the atomic weight, **calculate the density of the gold**, if it's atomic radius 0.1442 nm and it has FCC crystal structure and an atomic weight of 196.97 g/mol. 6 marks.

End of Questions

Good Luck