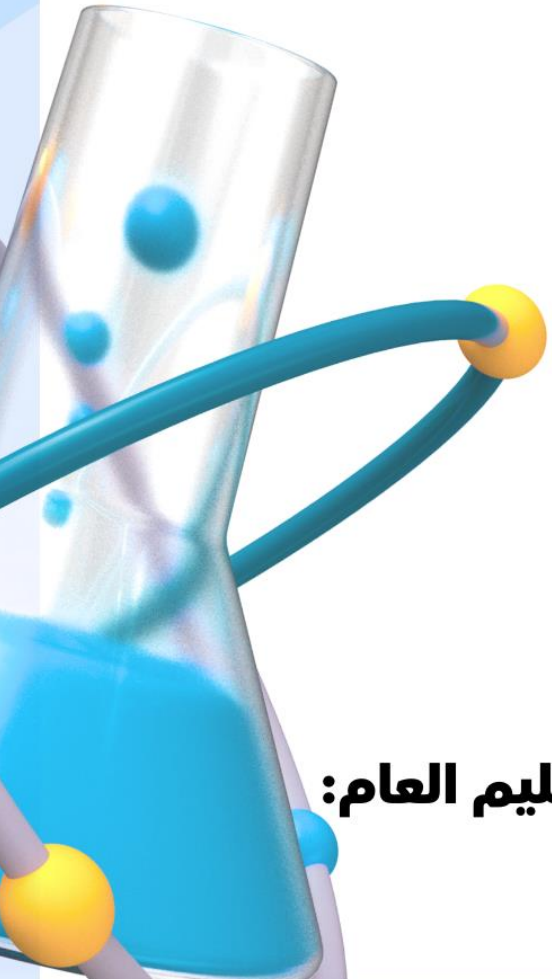
الإدارة المركزية للتعليم العام
مكتب تنمية مادة العلـــــوم

CHEMISTRY

2nd secondary

Second term

HOME PERFORMANCE



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رئيس الإدارة المركزية للتعليم العام:
د. هالة عبدالسلام خفاجي

2026

week

4

Home performance (Week 4)

Q1/ choose the correct answer:-

1- The hybrid orbital is.....

(a) More active and less protruded

(b) More protruded and less capable to overlapping

(c) More protruded and more capable to overlapping

(d) Less active than a pure orbital

2-All of the following are conditions for hybridization except:

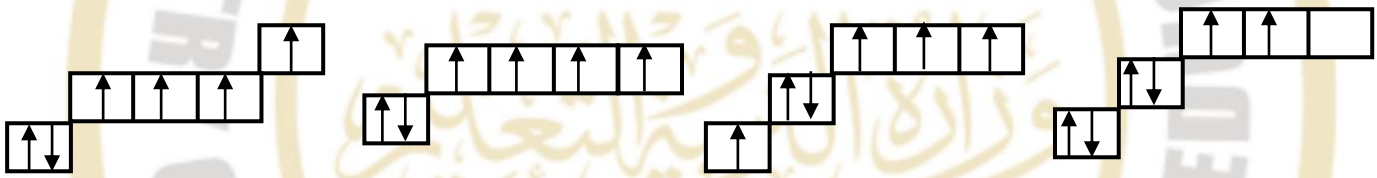
(a) It occurs between orbitals of the same atom

(b) It occurs between orbitals that are close in energy

(c) The electrons of the atom must be excited

(d) The number of orbitals entering = the number of orbitals resulting.

3- Which of the following represents a hybrid carbon atom in methane?



(a) (b) (C) (d)

4- Which of the following choices expresses the orbitals involved in the formation of sigma (σ) bonds in hydrogen cyanide (H-CΞN)?

	Sigma bond between (C) and (H)	**Sigma bond between (C) and (N)**
a	(p_y) of a carbon atom with (s) of a hydrogen atom	(p_y) of a carbon atom with (sp) of a nitrogen atom
b	(sp^2) of a carbon atom with (s) of a hydrogen atom	(sp) of a carbon atom with (sp^3) of a nitrogen atom
C	(sp) of a carbon atom with (s) of a hydrogen atom	(sp) of a carbon atom with (sp) of a nitrogen atom
d	(p_z) from a carbon atom with (s) from a hydrogen atom	(sp^2) from a carbon atom with (sp^2) from a nitrogen atom

5- According to the V.B.T, which of the following expresses the readiness of an oxygen atom to form covalent bonds in a water molecule?

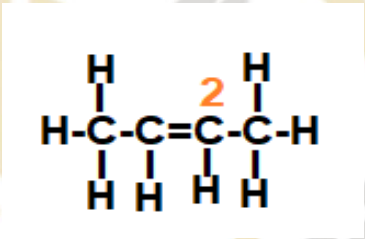
A) Excitation of one of the electrons in the (2s) subshell, followed by (sp^2) Hybridization.

b) No excitation of the subshell electron (2s) and hybridization of type (sp^3)

c) Excitation of one of the subshell electrons (2s) followed by hybridization of type (sp^2)

d) No excitation of the subshell electron (2s) and hybridization of type (sp^2)

6-Which of the following represents the electronic distribution of carbon atom Number (2) in the corresponding molecule?



(a) $1s^2, (sp^2)^1, (sp^2)^1, (sp^2)^1, 2p_z^1$

(b) $1s^2, (sp^3)^1, (sp^3)^1, (sp^3)^1, (sp^3)^1$

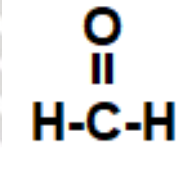
(C) $1s^2, (sp)^1, (sp)^1, 2p_y^1, 2p_z^1$

(d) $1s^2, 2s^2, 2p^2$

7-The sigma bond between the two carbon atoms in the ethylene molecule C_2H_4 is formed as a result of the overlap between the orbitals:

(a) $1S^1$ & SP^3 (b) SP^2 & SP^2 (c) $1S^1$ & $1S^1$ (d) $1S^1$ & $2P_Z^1$

8- Which of the following describes the orbitals involved in the formation of the sigma (σ) bond between the carbon atom and the oxygen atom in formaldehyde molecule shown in the figure?



A) The sp^2 orbital of the carbon atom with the sp orbital of the Oxygen atom

B) The sp^2 orbital of the carbon atom with the sp^2 orbital of the Oxygen atom.

C) The overlap of the sp orbital of the carbon atom with the sp orbital of the Oxygen atom.

D) The overlap of the sp^2 orbital of the carbon atom with the 2S orbital of the Oxygen atom.

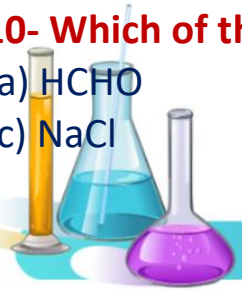
9- Which of the following choices expresses the number of pure orbitals involved in hybridization to produce SP^3d hybrid orbitals?

(A) 3 (B) 4 (c) 5 (d) 6

10- Which of the following compounds contains two types of bonds?

(a) HCHO (b) $Ba(CN)_2$

(c) NaCl (d) PCl_3



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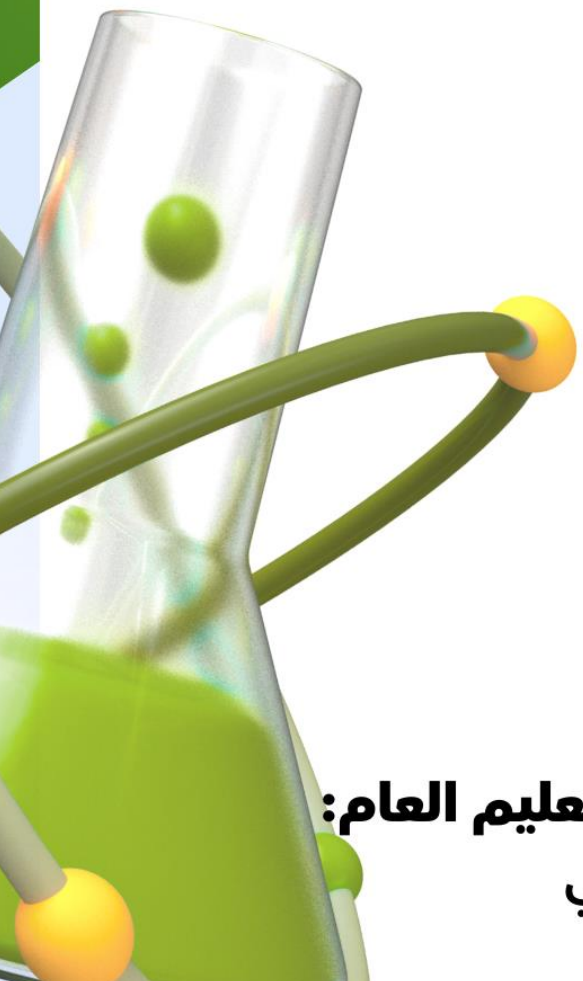
WEEKLY ASSESSMENTS



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week

4

Weekly assessment (Week-4)

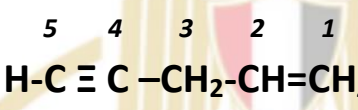
A

Q1/ State the scientific reason:

- Although a carbon atom has two unpaired electrons in its ground state, it forms four covalent bonds in a methane molecule.

.....

Q2/ Study the following compound well and then answer the following questions:



1-Identify the type of orbitals involved in the formation of the bond Between carbon atom (1) and hydrogen atom

.....

2- What is the number of pi bonds and the number of electron densities around carbon Atom number (5)?

.....

Q3/ Choose the correct answer: -

1- Element (X) is located in group (15) of the periodic table. When forming the molecule XH_3

- Which of the following expresses the type of hybridization in the central atom according to the valence bond theory?

A) sp^3
B) sp^2
c) No hybridization occurs
d) sp

2- The central atom in all of the following compounds undergo SP^2 hybridization except:

A) C_2H_4
B)CH_2=CHCl
C) HCHO
D) H_2O

3- Which pairs of the following compounds agree in the type of hybridization?

A) C_2H_4 - CO_2 B) NH_3- BF_3
C) CH_4 -H_2O D) $BeCl_2$ -H_2O

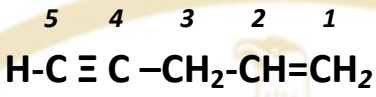
B

Q1/ State the scientific reason:

- No excitation occurs in the oxygen atom when water molecules are formed.

……

Q2/ Study the following compound well and then answer the following questions:



1-Identify the type of orbitals involved in the formation of the bond Between carbon atoms (3) and (4)

……

2- How many sigma bonds are there between carbon atoms and hydrogen atoms in the Molecule?

……

Q3/ Choose the correct answer: -

1- Which of the following expresses the orbitals involved in the formation of bonds Between carbon atoms in the ethylene molecule?

a) sp -sp is a sigma bond , p_y-p_y is a pi bond

C) sp^2-sp^2 is a sigma bond , p_y-p_y is a pi bond

d) sp -sp is a sigma bond , p_z-p_z is a pi bond

c) sp^2-sp^2 is a sigma bond , p_z-p_z is a pi bond

2- All of the following compounds undergo (sp) hybridization except:

a) C_2H_6

b) CH Ξ CCl

C) CO_2

d) C_2H_2

3- Which pairs of the following compounds do not agree in the type of hybridization of the central atom?

a) CH_4 - C_2H_6

b) H_2O - NH_3

C) $BeCl_2$ -H_2O

d) CH_4 - NH_3

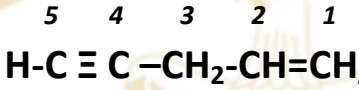
C

Q1/ State the scientific reason:

- No excitation occurs in the nitrogen atom when ammonia gas is formed

.....

Q2/ Study the following compound well and then answer the following questions:



1-Identify the type of orbitals involved in the formation of the bond Between carbon atoms (2) and (3)

.....

2- How many sigma bonds are there between carbon atoms in the molecule?

.....

Q3/ Choose the correct answer: -

1- Element (X) is located in group (16) of the periodic table. When forming the H_2X molecule

- Which of the following expresses the type of hybridization in the central Atom according to the valence bond theory?

a) sp^3
b) sp^2
c) No hybridization occurs
d) sp

2- All of the following compounds undergo SP^3 hybridization except:

a) $C H_4$
b) H-CΞN
C) NH_3
d) H_2O

3- Which pairs of compounds agree in the type of hybridization of the central Atom?

a) $C_2H_2 – BeCl_2$
b) NH_3- BF_3
C) C_2H_4 -H_2O
d) $BeCl_2$ -H_2O