This print-out should have 13 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering. The due time is Central time.

Mlib 02 4039

08:12, general, multiple choice, > 1 min, fixed.

001

The electron configuration for the ground state of an isolated Fe atom is

1. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8$.

2. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^6$.

3. $1s^2\ 2s^2\ 2p^6\ 2d^{10}\ 3s^2\ 3p^6$.

4. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 4p^6$.

Mlib 02 4061

08:12, general, multiple choice, > 1 min, fixed.

002

What is the ground state electronic configuration of an atom of arsenic (As)?

1. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 4p^6\ 5s^2\ 5p^5$

2. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^3$

3. $1s^2\ 1p^6\ 2s^2\ 2p^6\ 2d^{10}\ 3s^2\ 3p^5$

4. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^8\ 4p^3\ 5s^2$

5. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 4p^6\ 3d^7$

Msci 05 1605

08:12, general, multiple choice, > 1 min, fixed.

003

According to the Aufbau principle, what orbital is filled after the $6s$ orbital?

1. $5d$

2. $4d$

3. $4f$

4. $6p$

Msci 05 1653

08:12, general, multiple choice, > 1 min, fixed.

004

What is the electronic configuration of yttrium (symbol Y)?

1. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 5s^3$

2. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 5s^2\ 5p^1$

3. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 4p^6\ 3d^{10}\ 3f^3$

4. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^2\ 4d^1$

5. $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 4d^3$

Brodbelt 05 04

08:07, general, multiple choice, > 1 min, fixed.

005

An electron in a $3d$ orbital could have which of the following quantum numbers?

1. $n = 3;\ \ell = 2;\ m_\ell = 0$

2. $n = 3;\ \ell = 1;\ m_\ell = -1$

3. $n = 3;\ \ell = 2;\ m_\ell = -3$

4. $n = 3;\ \ell = 0;\ m_\ell = 0$

5. $n = 2;\ \ell = 2;\ m_\ell = 2$

6. $n = 2;\ \ell = 3;\ m_\ell = 0$

7. $n = 3;\ \ell = 3;\ m_\ell = 1$

ChemPrin3e 01 44

08:08, general, numeric, > 1 min, wording-variable.

006

How many values of the quantum number ℓ are possible when $n = 5$?

1. 5

2. 4

3. 6

4. 7

5. 3

007

How many values of m_ℓ are allowed for an electron in a 5 f subshell?

1. 7

2. 5

3. 6

4. 4

5. 3

008

How many values of m_ℓ are allowed for an electron in a 2 s subshell?

1. 1

2. 3

3. 4

4. 2

5. None of these

009

How many subshells are there in the shell with $n = 3$?

1. 3

2. 4

3. 5

4. 6

5. 2

Msci 05 1433

08:07, general, multiple choice, > 1 min, fixed.

010

Set(s) of possible values of m_ℓ are
A) $-4; -3; -2; -1; 0; +1; +2; +3; +4$
B) $-3; -2; -1; 0; +1; +2; +3$
C) $-2; -1; 0; +1; +2$
D) $-1; 0; +1$
E) 0

Select the best choice for $n = 3$.

1. only A

2. only B

3. only C

4. only D

5. only E

6. A, B, C, D, and E

7. only B, C, D, and E

8. only C, D, and E

9. only D and E

ChemPrin3e T01 66

08:08, general, multiple choice, < 1 min, fixed.

011

What is the subshell notation and the number of orbitals having the quantum numbers $n = 4$, $\ell = 3$?

1. 4d and 5

2. 4p and 3

3. 3f and 7

4. 3d and 5

5. 4f and 7

Msci 07 0104

11:01, general, multiple choice, > 1 min, fixed.

012

The correct Lewis electron dot representation for Si is

1. Si

2. Si

3. Si

4. Si

5. Si

6. Si

7. Si

8. Si

Mlib 76 1022

11:01, general, multiple choice, > 1 min, fixed.

013

In a Lewis formula the dots represent

1. the valence electrons in all the atoms.

2. all the electrons in the atoms.

3. only the electrons that are being transferred or shared.

4. however many electrons are needed to satisfy the octet rule.