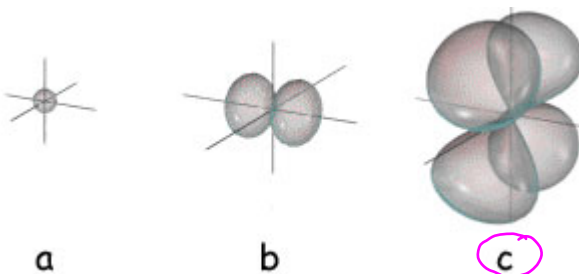


## Question 1

4 Points

Each of the orbitals depicted has the **lowest** value of  $n$  possible for its type. Which one has the **highest**  $n$  value?



## Question 2

6 Points

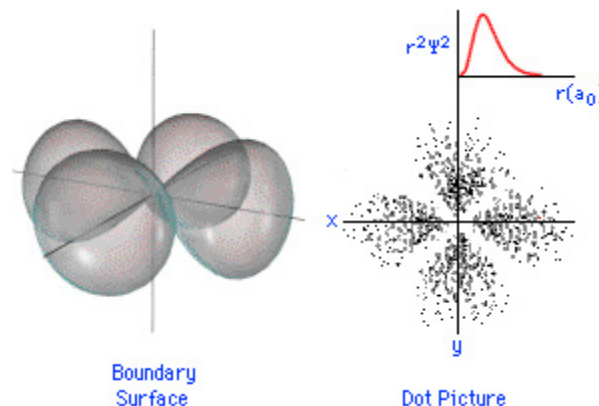
The orbital depicted on the left is:

a. What **type** of orbital? d

b. Its  $n$  value is? 3

c. Its **specific** designation is?

$3d_{x^2-y^2}$   
( $xy$ ,  $xz$ ,  $yz$ ,  $x^2-y^2$ ,  $z^2$ )



## Question 3

4 Points

Circle those of the following orbital designations are **true** designations?

2s    1d    4p    9d    1p    3f    4g

## Question 4

4 Points

Give the **complete** electronic configuration for the following:

a. P  $1s^2 2s^2 2p^6 3s^2 3p^3$

b.  $Al^{3+}$   $1s^2 2s^2 2p^6$

## Question 5

6 Points

Give the **noble gas** configuration for the following

a. Kr  $[Ar] 4s^2 3d^{10} 4p^6$

c. Cu  $[Ar] 4s^1 3d^{10}$

b.  $Ni^{2+}$   $[Ar] 3d^8$

## Question 6

6 Points

Give the **symbol** of the expected **diamagnetic** elements in period 5? Sr, Cd, Xe

## Question 7

6 Points

Using only the periodic table **arrange** the following elements in order of **increasing atomic radius**: sodium, cesium, potassium

Na  
Smallest

K

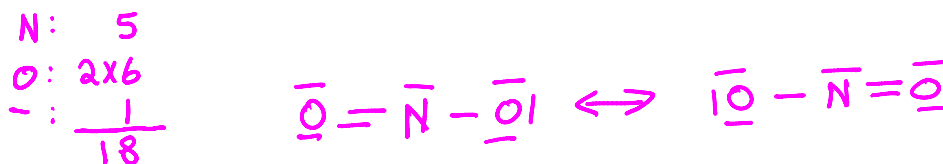
Cs  
Largest



Question 13

6 Points  
(4 Points)

Draw all **reasonable** resonance structure for  $\text{NO}_2^-$ .



Circle the best answer:

*Average bond length table is on the front page of this exam.*

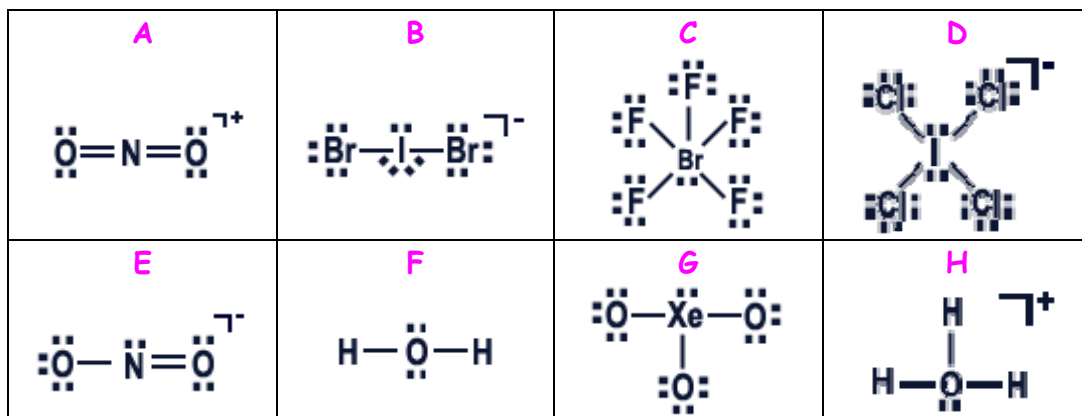
(2 Points)

The N to O bond length in pm is expected to be:

1. = 136      **2.** > 115      3. = 115      4. > 136

Question 14

20 Points



1. List the structure(s) whose **only** bond angle is  $180^\circ$

A, B

2. Give the **electron pair geometry (epg)** for:

A: linear

C: Octahedron

B: Trigonal bipyramid

E: TRIGONAL planar

3. Give the **molecular geometry** for:

D: Square planar

F: Angular/Bent  $109^\circ$

G: Trigonal pyramidal

H: Trigonal pyramid

4. E, F, G, and H. The molecule with the **smallest bond angle**?

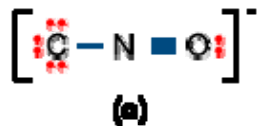
F

Question 15

6 Points

A resonance structure of  $\text{CNO}^-$  is given below:

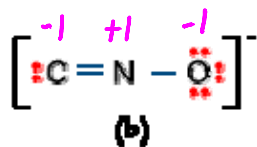
Give the formal charge on:



C -3      N 1      O 1

Question 16  
6 Points

Another resonance structure of the same molecule is given below



Do you consider this a **better** structure than that in Question 15? Yes

Why? Much smaller charge separation.

Why?

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*Do Not Write Below This*

Exam II Score