CHEMISTRY

NCERT - FULL MARKS

CHEMISTRY(TAMIL)

ATOMIC STRUCTURE-I

Example

1. What is the total number of orbitals associated with the principal quantum

number n=3 ?

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2. Using s, p, d, f notations, describe the orbital with the following quantum numbers (a) n=2, l = 1 (b) n = 4, l = 0 (c) n = 5, l = 3 (d) n = 3, l = 2.

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Questions A Choose The Best Answer

1. Atomic mass of an element is not necessarily a whole number because :

A. It contains electrons, protons and neutrons

B. It contains allotropic forms

C. Atoms are no longer considered indivisible

D. Atoms are no longer considered indivisible

Answer:

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2. No two electrons in an atom will have all four quantum numbers equal. The statement is known as

A. Exclusion principle

B. Uncertainity principle

C. Hund's rule

D. Aufbau principle

Answer:

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3. When the 3d orbital is complete, the new electron will enter the

A. 4p orbital

B. 4f orbital

C. 4s orbital

D. 4d orbital

Answer:

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4. The preference of three unpaired electrons in the nitrogen atom can be explained by :

A. Pauling's exclusion principle

B. Aufbau principle

C. Uncertainty principle

D. Hund's rule

Answer:

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5. The number of orbitals in a p-sub-shell is

A. 1

B. 2

C. 3

D. 6

Answer:

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6. The nucleus of an atom contains :

A. Electrons and protons

B. Neutrons and protons

C. Electrons, protons and neutrons

D. Neutrons and electrons

Answer:

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7. A statement among the following is

A. An atom of hydrogen

B. An electron

C. A neutron

D. A proton

Answer:

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8. Which of the following is not a component of the nucleus?

A. Deuterium

B. Helium

C. Hydrogen

D. Tritium

Answer:

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9. When the value of the azimuthal quantum number is 3, the magnetic quantum number can have values :

A. $+1, -1$

B. $+1, 0, 1$

C. $+2, +1, 0, -1, -2$

D. $+3, +2, +1, 0, -1, -2, -3$

Answer:

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10. 2p orbitals have :

A. $n = 1, l = 2$

B. $n=1, l = 0$

C. $n = 2, l = 0$

D. $n = 2, l = 1$

Answer:

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11. The atomic number of an element is 17 and its mass number is 37. The number of protons, electrons and neutrons present in the neutral atom are :

A. 17, 37,20

B. 20,17,37

C. 17, 17, 20

D. 17, 20,17

Answer:

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12. . The maximum number of electrons that can be accommodated in the nth level is :

A. n^2

B. $n+1$

C. $n-1$

D. $2n^2$

Answer:

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13. Principal quantum number determines

A. The distance of the orbital from the nucleus

B. The shape of the orbital

C. The orientation of the orbital in space

D. The spin of the electron

Answer:

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Questions B Fill Up The Blanks

1. Death rate is known as .....

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2. When ultraviolet rays incident on metal plate there photoelectric effect does not occur, it occurs by incident of

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3. Cathode rays produce .....on the walls of the discharge tube.

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4. The radiations which were not influenced by a magnet were called.....

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5. Neutrons are discovered by ....

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Questions C Write In One Or Two Sentence

1. What is the charge of an electron, proton and a neutron ?

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2. What is atomic number?

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3. What is the maximum number of electrons that an orbital can have?

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4. How many orbitals are there in the second orbit? How are they designated?

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5. Sketch the shape of s and p-orbital indicating the angular distribution of electrons

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6. What are the charge and mass of an electron?

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7. Suppose that the uncertainty in determining the position of an electron in an orbital is 0.6 Å. What is the uncertainty in its momentum?

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8. What is meant by principal quantum number?

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9. How many protons and neutrons are present in ${}_{8}^{18}O$?

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10. What are the particles generally present in the nuclei of atoms?

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11. The atomic mass of an element is 24 and its atomic number is 12. Show how the atom of the element is constituted?

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12. What is the principal defect of Bohr atom model?

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13. Write the complete symbol for : (a) The nucleus with atomic number 56 and mass number 138 , (b) The nucleus with atomic number 26 and mass number 55 , (c) The nucleus with atomic number 4 and mass number 9.

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14. An atomic orbital has n = 3. What are the possible values of l ?

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15. An atomic orbital has l= 3. What are the possible values of m?

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16. Correct electronic configuration of Cr is

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17. Which energy level does not have p-orbital?

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18. An atom of an element has 13 electrons and mass number 27. the nucleus of this atom contains _____ neutrons.

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19. How many electrons can have s+ ½ in a d-sub-shell?

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20. Write the values of l and m for p-orbitals

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21. Suppose that the uncertainty in determining the position of an electron in an

orbital is 0.6 Å. What is the uncertainty in its momentum?

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22. What is shape of the orbital with (i) $n = 2$ and $l = 0$, (ii) $n = 2$ and $l = 1$?

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23. Give the values for all quantum numbers for 2p electrons in nitrogen ($Z = 7$).

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24. Give the electronic configuration of Mn^{2+} and Cr^{3+} ions .

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25. Explain why the electronic configuration of Cr andCu are written as $3d^5, 4s^1$ and $3d^{10}4s^1$ instead of $3d^44s^2$ and $3d^94s^2$?

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Questions D Explain Briefly On The Following

1. Describe Aufbau principle. Explain its significance in the electronic build up of atoms.

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2. Using the s, p, d, notation, describe the orbital with the following quantum numbers?

(a) n = 1, l=0, (b) n = 2,l = 0, (c) n = 3, l = 1, (d) n = 4, l =3.

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3. Using the a Aufbau principle, write the electronic configuration in the ground state of the following atoms : Boron (Z = 5) Neon (Z = 10) and Aluminium (Z = 13).

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4. What is Rutherford's α- ray scattering experiment? What are its conclusions

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5. What are the postulates of Bohr theory of atom?

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6. Explain the various quantum numbers which completely specify the electron of an atom

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