



CHEMISTRY

NCERT - NCERT CHEMISTRY (GUJRATI)

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. It contains isotopes

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. Uncertainty principle
- C. Hund's rule
- D. Aufbau principle

Answer: Exclusion principle



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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: 4p orbital



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: Hund's rule



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

A. 1

B. 2

C. 3

D. 6

Answer: 3



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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. Which is the lightest among the following?

A. An atom of hydrogen

B. An electron

C. A neutron

D. A proton

Answer: An electron



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8. Which of the following has no neutrons in the nucleus?

A. Deuterium

B. Helium

C. Hydrogen

D. Tritium

Answer: Hydrogen



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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: +3, +2, +1, 0, -1, -2, -3



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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: $n = 2, l = 1$



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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: 17, 17, 20



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

A. n^2

B. $n + 1$

C. $n - 1$

D. $2n^2$

Answer: $2n^2$



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13. The magnetic quantum number decides :

- 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: The orientation of the orbital in space



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Questions B Fill Up The Blanks

1. The decomposition of an electrolyte by passage of electricity is known as



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2. When cathode rays are focused on thin metal foil, it gets heated up to



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3. Cathode rays produceon 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. What are the charge and mass of an electron?



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6. What is an orbital?



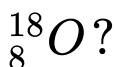
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7. Give the order of filling of electrons in the following orbitals 3p, 3d, 4p, 3d and 6s.



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8. How many protons and neutrons present in



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



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10. 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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11. What is the principal defect of Bohr atom model?



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



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



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14. Give the electronic configuration of chromium. ($Z=24$).



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



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16. An atom of an element has 19 electrons.

What is the total number of p-orbital?



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17. How many electrons can have $s + \frac{1}{2}$ in a d-sub-shell?



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



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19. Which quantum accounts for the orientation of the electron orbital?



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



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



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22. Give the electronic configuration of Mn^{2+} and Cu. Atomic number of Cu = 29 and Mn = 25.



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23. Explain why the electronic configuration of Cr and Cu 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. 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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2. Using the 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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