MULTIPLE CHOICE QUESTIONS:

which of the following materials having no energy gap

1 A Conductors B Semi-conductor
C Insulator D None of these

The Filling of electrons in molecular orbital takes place according to

2 A Afbau Principle B Pauli Exclusion Principle
C Hunds Rule D All the above

Bond Order of O_2, F_2, N_2 respectively are _____

3 A +1, +2, +3 B +2, +3, +1
C +2, +1, +3 D +3, +2, +1

Hydrogen molecule formed by combination of ---------- orbitals

4 A S-S B P-P
C P-d D d-d

Which of the atomic orbitals have more energy

5 A Bonding molecular orbitals B Anti-Bonding molecular orbitals
C Covalent bond D Ionic bond

Arrange O_2 ,O_2^- , O_2^{2-} and O_2^+ in order of increasing bond length

6 A $O_2^+ < O_2 < O_2^- < O_2^{2-}$ B $O_2^{2-} < O_2 < O_2^- < O_2^+$
C $O_2 < O_2^- < O_2^{2-} < O_2^+$ D $O_2^- < O_2^{2-} < O_2^+ < O_2$

Which theory is explaining the photo electric effect

7 A Planks quantum theory B Bohr's atomic model
C Rutherford model D Thomson model

The interaction between a pair of orbitals of the same type is

8 A Attractive B Repulsive
C No interaction D None of the above

Unpair electron present in the shell it shows

9 A High spin B Low spin
C Neutral D None of the above

The octahedral complex contain ---------- ligands

10 A 2 B 4
C 6 D 3

Intrinsic semiconductor

11 A $n_e = n_h = n_i$ B $n_e > n_h = n_i$
C $n_e = n_h < n_i$ D $n_e < n_h < n_i$

Nanomaterials are materials with dimensions and tolerance in the range of

12 A 100nm- 0.1nm B 10nm- 0.1nm
C 100nm- 0.01nm D 1000nm- 0.1nm

Super Capacitor is also known as

13 A Capacitor B Ultra-Capacitor
C Double layer Capacitor D None of these

Example of semi conductor

14 A Silicon B Boron

C Chlorine D Hydrogen

15 The number of antibonding electrons present in N_2 , O_2 molecules is

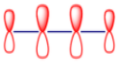
A 10,10 B 4,6

C 6,4 D 3,2

16 Which of the following is a noble gas configuration**?**

A $1S^2\ 2S^2$ B $1S^2\ 2S^2\ 2P^4$

C $1S^2\ 2S^2\ 2P^4\ 3S^2$ D None of these

17 How many nodes are present in the below figure 

A 0 B 2

C 1 D 4

18 The oxidation number of cobalt in $K[Co(CO)_4]$ is

A -1 B +1

C -3 D +3

19 A doped semiconductor is also known as

A Intrinsic semiconductor B Extrinsic semiconductor

C Diffused semiconductor D None of the above

20 The total probability of finding the particle in space must be

A Zero B Unity

C Infinity D Double

21 The energy of a photon of light has what kind of proportionality to its frequency and its wavelength

A directly, inversely B inversely, directly

C Inversely, inversely D directly , directly

22 The ejected electrons from the surface of metal in photoelectric effect are called

A Proton B Electron

C Neutron D Photoelectrons

23 Dual nature [particle and wave] of matter was proposed by

A de Broglie B Planck

C Einstein D Newton

24 Antibonding molecular orbitals are produced by_____of atomic orbitals

A Constructive interaction B Destructive interaction

C Overlap of two negative ion D All the above

25 The oxygen molecule is paramagnetic. It can be explained by

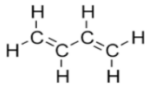
A Resonance B Hybridization

C Valence bond theory D Molecular orbital theory

26 Which of the following is not paramagnetic?

A CO B N_2^+

C NO D O_2^-

27 Find the name of the structure 

A Formaldehyde B Benzene

C 1-3 butadiene D None of the above

The highest occupied molecular orbital or HOMO in 1,3- Butadiene is

28 A π B π_2

C π_2^* D π_3

Relation between bond order and bond length

29 A Directly proportional B Indirectly proportional

C No relation D Cannot predict

Given the list of ligands and their corresponding names, choose the pair that disagree.

30 A OH^- - Hydroxo B CN^- - Cyanide

C Cl^- - Chloro D H_2O - Aqua

Which of the following is a semi-conductor

31 A Diamond B Arsenic

C Gallium arsenide D phosphorous

How are charge carriers produced in intrinsic semiconductors?

32 A Electrons B Holes

C Both A&B D None of these

A doped semiconductor is also known as

33 A Intrinsic semiconductor B Extrinsic semiconductor

C Diffused semiconductor D None of the above

The tetrahedral complex contain ---------- ligands

34 A 8 B 1

C 4 D 6

The current flow through electrolyte is due to the movement of

35 A ions B holes

C electrons D None of the above

According to Molecular Orbital Theory, the shape and size of a molecular orbital depends upon _____ combining atomic orbitals

36 A Shape and size of B Number of

C Orientation of D All of the mentioned

When the valence d orbitals of the central metal ion are split in energy in an octahedral ligand field, which orbitals are raised least in energy?

37 A d_{xy} and $d_x2_{-y}2$ B d_{xy}, d_{xz} and d_{yz}

C d_{xz} and d_{yz} D None of the above

In molecular orbital representation of benzene ,how many π molecular orbitals are present?

38 A 8 B 1

C 2 D 6

How many types of molecular orbital are there?

39 A 1 B 2

C 3 D 4

Consider the coordination compound, $K_2[Cu(CN)_4]$. A coordinate covalent bond exists between

40 A K^+ and CN^- B Cu^{2+} and CN^-

C K^+ and $[Cu(CN)_4]^{2-}$ D None of these