Shikshan Mandal,Karad's

Mahila Mahavidyalay,Karad

B.Sc. (Part –I)(Preliminary-I) Examination

DCS-8A-Chemistry-I (CBCS)

(Inorganic Chemistry-I)

Date: 04/01/2023 Day: Wednesday

Time: 1:00 to 3:00 pm Total Marks: 40

Instruction:

1. All questions are compulsory.
2. Figures to the right indicate full marks.

1. Choose the most correct alternative. (8)

a) Heisenberg uncertainty principle states that, it is impossible to determine the _ _ _ _ and _ _ _ _ _ _ _ _ of a microscopic particle simultaneously.

i) Position and Momentum. ii) Density and Mass.

iii) Velocity and Atomic Number. iv) Momentum and Wavelength.

b) Shape of P – atomic orbital is - _ _ _ _ _ .

i) Spherical ii) Double – dumbbell

iii) Dumbbell iv) Not Defined

c) When two atomic orbitals combine, they form ___

i) One molecular orbital. ii) Two molecular orbitals.

iii) Three molecular orbitals. iv) Four molecular orbitals.

d) Which of the following ionic compounds would have the greatest distance between the cation and anion centres in crystals?

i) LiI ii) CsF

iii) CsI iv) Li

e) Predict whether which of the following molecules is polar.

i) PCl_5 ii) H_2O

iii) CH_4 iv) SO_3

f) What's the bond order of N_2?

i) 0 ii) 2

iii) 1 iv) 3

g) Principle quantum number represent .....?

i) energy of electron ii) spin of electron

iii) orientation of orbital iv) shape of orbital

h) The radiations emitted by hot bodies are called as.....

i) X-ray. ii) Black- body radiation.

iii) Gamma radiation. iv) visible light.

Q. 2 Attempt any Two of the following. (16)

a) Give detailed explanation of Born-Haber cycle for Sodium-Chloride and give applications of Born Haber cycle.

b) Explain postulates (assumotions) of Bohrs theory of hydrogen.

c) Explain the types of molecular orbitals with example.

i)Homonuclear diatomic molecules

ii) Hetronuclear diatomic molecules

Q.3 Attempt any Four of the following (16)

a) Write difference between Atomic Orbitals and Molecular Orbitals.

b) Explain following terms:

a. Aufbau's Principle.

b. Hund's rule of maximum multiplicity.

c. Pauli's exclusion principle.

c) Write difference between Bonding and antibonding MOs.

d) Write short note on:

a. VBT

b. Hybridisation

e) Discuss shapes of s,p,d orbitals & Explain the stability of empty, half filled, completely filled orbital with suitable examples.

f) Explain structure and hybridization in following molecules $BeCl_2$, Bf_3,, PCl_5, IF_7.

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B.Sc. (Part –I)(Preliminary-I) Examination

DSC-4A-Chemistry-II (CBCS)

(Organic Chemistry-II)

Date: 05/01/2023 Day: Thursday

Time: 1:00 to 3:00 pm Total Marks: 40

Instruction:

1. All questions are compulsory.
2. Figures to the right indicate full marks.

Q.1. Choose the most correct alternative. (8)

a) Homolytic bond fission is favored by _ _ _ _ .

i) UV rays . ii) Heat.

iii) Polar solvent iv) both a & b

b) carbonion are electron - _ _ _ _ _ .

i) poor ii) rich

iii) neutral iv) Not Defined

c) An opyically active molecule lacks ___ of symmetry.

i) Centre ii) plane.

iii) Alternating axis iv) All of these

d) Which of the following is not Chiral.

i) 2- cholorobutane ii) lattice

iii) 3 chloropentane iv) 2-aminopropionic acid

e) Non – superimposable mirror image of an optically active compound can be

i)Optical antipodes ii) distereomers

iii) enantiomers iv) enantiomorphs

f) Benzene is_____in nature

i) Acidic ii)Basic

iii) Amphoteric iv)Neutral

g) In benzene ____type of overlapping is not observed

i) $sp^2 - sp^2$ ii) p-p

iii) sp^2-s iv) sp-sp

h)The general formula of cyclohexane is.....

i) C_nH_{2n+2}. ii) C_nH_{2n}

iii) C_nH_{2n} -2 iv) C_nH_{n+2}.

Q. 2 Attempt any Two of the following. **(16)**

a) Discuss Nitration, sulphonation, halogenation Friedel-craft reaction?

b) What are cycloalkenes? Give any three methods by which cycloalkane are prepared? what is the action of a) Hydrogen b) Halogen under different condition c) Halogen acid on cyclohexane

c) What is carbocation? Give method of preparation of carbocation and explain structure and stability of carbocation

Q.3 Attempt any Four of the following **(16)**

a) Give any two methods of preparation and chemical properties of cycloalkanes

b) Write note on Diels Alder reaction

c) Explain the term a)Non aromatic b) Antiaromatic c)Aromatic d) Pseudoaromatic

d) Explain pseudo aromatic compounds

e) Hyperconjugation.

f) F.Carbanion