

B2M17137

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Reg. No:.....

Name:

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester B.Sc Chemistry Degree Examination, March 2017
 CHE2B02 – Core Course II : Theoretical and Inorganic Chemistry – II
 (2016 Admission onwards)

Max. Time: 3 hours

Max. Marks: 80

Section A(one word)

Answer all questions. Each question carries 1 mark

1. The geometry of ClF_3 is-----.
2. A 2S orbital has ----- nodes.
3. A cation is always ----- than the corresponding atom.
4. Greater the bond order, ----- will the bond dissociation energy.
5. The ionization enthalpy of nitrogen is----- than that of oxygen.
6. Name an organic compound with intermolecular hydrogen bonding.
7. ----- is a molecular species with bond order zero.
8. The group eighteen elements of the periodic table are called -----.
9. Sketch the shape of $d_{x^2-y^2}$ orbital.
10. ----- is a molecule which can be approximated as to particle in a 1D box.

(10 x 1 = 10 Marks)

Section B(short answer)

Answer any ten questions. Each question carries 2 mark

11. Define electro negativity.
12. What are operators? Name one quantum mechanical energy operator.
13. Give any two applications of Slater's rule.
14. Electron affinity of Cl is greater than that of F. Why?
15. Compare the dipole moment values of water and carbon dioxide.
16. Define lattice energy.
17. What is LCAO principle.
18. What are inter- molecular hydrogen bonds.
19. What are polar covalent bonds? Give one example.
20. Differentiate H_2O and H_3O^+ based on the hybridization?
21. BaSO_4 is insoluble even though it is ionic in nature. Why?
22. What are inner transition elements?

(10 x 2 = 20 Marks)

Section C(paragraph)

Answer any five questions. Each question carries 6 marks

23. What are the main postulates of quantum mechanics? Explain.
24. Explain the concept of degeneracy
25. Write a note on Hamiltonian operator.
26. Define ionization potential. Explain the factors affecting it.
27. Explain how the state of hybridization influences electro negativity.
28. What are the basic features of Pauling scale of electronegativity?
29. Explain the concept of resonance with the help of two examples.
30. State and explain Hund's rule.

(5 x 6 = 30 Ma

Section D (Essay)

Answer any two questions. Each question carries 10 marks

31. Derive an expression for energy of an electron by setting up Schrodinger wave equation for a particle in a one dimensional box.
32. Explain the classification of elements into different blocks in the periodic table. Give their characteristic properties.
33. State and explain the postulates of VSEPR theory. Apply the theory to explain the structure of XeF_2 , XeF_4 and XeF_6 .
34. Explain the molecular orbital theory of bonding. How is it superior to valence bond theory.

(2 x 10 = 20 M

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
 Second Semester B.Sc Degree Examination, March 2017
 CHE2C02 – Physical Chemistry
 (2016 Admission onwards)

Max. Time: 3 hours

Max. Marks: 64

Section A (One word)*Answer all questions. Each question carries 1 mark.*

1. A system which can exchange neither energy nor matter with its surroundings is called a----- system.
2. During the vapourisation of a liquid, entropy
3. The number of atoms per unit cell of a crystal with bcc lattice is.....
4. With increase in temperature the most probable velocity of a gas.....
5. With rise in temperature , viscosity of a liquid
6. The boiling point of a liquid with increase in external pressure.
7. The SI unit of surface tension is
8. On dilution molar conductance of a solution
9. An equimolar mixture of acetic acid and sodium acetate in solution forms an example for a buffer.
10. Electrolytic conduction is due to the flow of

(10 x 1 = 10 Marks)**Section B(Short answer)***Answer any seven questions. Each question carries 2 marks.*

11. Distinguish between intensive properties and extensive properties. Give suitable examples.
12. Define specific conductance. How does it vary with dilution.
13. Distinguish between strong and weak electrolytes.
14. What are isotonic solutions?
15. State and explain Boyle-van't hoff law for solutions.
16. Define the term root mean square velocity of a gas.
17. Calculate the RMS velocity of O₂ molecule at 100^oC
18. State and explain Charles law.
19. State the law of interfacial angles.
20. Give a sketch of the (222) planes of a bcc lattice.

(7 x 2 = 14 Marks)

SECTION- D

(Answer *any five* questions. Each question carries 8 marks)

24. What is inheritance in C++? Explain different types of inheritance.
25. What is polymorphism? Explain with suitable example.
26. Differentiate function overloading and operator overloading.
27. Write a C++ program to implement queue using an array.
28. Differentiate linear queue and circular queue.
29. Explain various Hashing methods in detail.
30. Explain binary search algorithm with a suitable example.
31. Write a program for Insertion sort. Perform insertion sort on the data given. Show each step 71 17 86 100 54 27.

(5 x 8 = 40 Marks)

28

26

27