QP CODE: 20101100

20101100

Reg No : .....

Name : .....

B.Sc. DEGREE (CBCS) EXAMINATION, NOVEMBER 2020

Second Semester

Core Course - CH2CRT02 - THEORETICAL AND INORGANIC CHEMISTRY

(Common for B.Sc Chemistry Model I ,B.Sc Chemistry Model II Industrial Chemistry ,B.Sc Chemistry Model III Petrochemicals)

2017 ADMISSION ONWARDS

BC2E7CC3

Time: 3 Hours

Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Most of the space inside the atoms are ----------.
2. What is the number of nodal planes in ***s*** orbital?
3. Why do silver halides have low solubility in water?
4. Give the hybridisation and geometry of $BeCl_2$ molecule.
5. What do you meant by regular and irregular geometry based on VSEPR theory?
6. Among the molecules NaCl, $MgCl_2$ and $AlCl_3$ which has more covalent character and why?
7. Calculate the bond order of He_2. Does it exists?
8. Write the M O energy level order of CO.
9. How does hydrogen bond influence the acid strength of halogen acids?
10. Give two important uses of $KMnO_4$.
11. Why are lanthanides known as rare earth elements?
12. What is a cation exchanger?

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Explain Black body radiation with its spectrum.

14. Explain Pauli's Exclusion principle and Hund's rule

15. Write the Lewis dot structure of CO and NO_2 molecule.

16. Explain the important aspects of resonance with reference to the CO_3^{2-} ion.

17. On the basis of M O theory explain whether H_2 molecule exist or not.

18. Explain on the basis of free electron theory (a) High electrical conductivity of metals (b) metallic lusture

19. Energy is released during the conversion of F to F^- but energy is absorbed during the conversion of O^- to O^{2-} ion. Explain.

20. What is the origin of paramagnetism in transition metal compounds?

21. Discuss on the industrial uses of lanthanides.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. Derive the equation to calculate the energy of electron in Hydrogen atom and multi-electron ions?

23. Explain Valence Bond theory of covalent bonding with water molecule as an example. What are the limitations of V B theory?

24. Briefly discuss about van-der Waal's force.

25. What is Lanthanide contraction? Discuss the consequences of the lanthanide contraction.

(2×10=20)