21103140

QP CODE: 21103140

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, DECEMBER 2021

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

6E6C47FA

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

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

1. Write the equation to calculate the wavelength.
2. Write the Schrodinger Wave equation.
3. What is an ionic bond? Illustrate with an example.
4. Why H-O-H bond angle in water molecule is comparatively higher than H-S-H bond angle in H_2S molecule?
5. Draw the resonance structures of ozone molecule.
6. What is the hybridisation and bond angle in a tetrahedral molecule?
7. What is bonding molecular orbital?
8. Arrange the following in the order of stability. O_2, O_2^+, O_2^{2+}, O_2^- and O_2^{2-}.
9. Write the M O energy level order of NO.
10. Which is the strongest base : $La(OH)_3$ or $Lu(OH)_3$. Why?
11. Why **Rh-Ir** and **Pd-Pt** exhibit almost similar size?
12. What is Mischmetal?

(10×1=10)

Part B

*Answer any **six** questions.*

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

13. Explain Rutherford's atomic theory.

14. Explain why the left hand side of the spectrum of black body radiation is small.

15. State and explain octet rule and expanded octet rule with suitable examples.

16. Explain the non linear shape of H_2S and non planar shape of PCl_3 using VSEPR theory.

17. Differentiate inter molecular and intra molecular hydrogen bonding with suitable examples.

18. Write note on ion-dipole and dipole-dipole interactions.

19. What is screening effect?

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

21. Describe the oxidizing character of $KMnO_4$ in acidic and basic medium.

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. a) Explain the Bohr atom model of hydrogen atom
    b) Derive an equation for energy of electron on the third orbit of hydrogen atom.

23. (a) Dipole moment measurement help in finding the shape of molecule. Explain. (b) Bond length of HCl moleucle is 1.27 A^0. If the dipole moment is 1.080, what is its percentage ionic character.

24. Describe the following terms on the basis of the free electron model of bonding in metals.
    (a) Electrical conductivity of metals (b) Metallic lusture

25. Give a brief description on the occurrence and the extraction of lanthanides.

(2×10=20)