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K23U 4061

Reg. No. : .....

Name : .....

I Semester B.Sc. Degree (C.B.C.S.S. – O.B.E.-Regular/Supplementary/ Improvement) Examination, November 2023
(2019 Admission Onwards)
COMPLEMENTARY ELECTIVE COURSE IN CHEMISTRY/POLYMER CHEMISTRY
1C01CHE/PCH : Chemistry (for Physical and Biological Sciences)

Time : 3 Hours Max. Marks : 32

SECTION – A

Very short answer type. **Each** carries **1** mark. Answer **all 5** questions.

1. Draw the structure of ClF_3.
2. Name the four segments of the environment.
3. Write the Henderson equation for an acidic buffer.
4. What is the significance of the square of wave function ?
5. Calculate the bond order of B_2. **(5×1=5)**

SECTION – B

Short answer type. **Each** carries **2** marks. Answer **4** questions out of 6.

6. What is meant by quantization of angular momentum of an electron postulated in Bohr's theory ?
7. Calculate the wavelength of a matter wave associated with an electron moving with a velocity of $1/100^{th}$ velocity of light.
8. Differentiate between bioaccumulation and biomagnification.
9. Discuss the chemistry of acid rain.
10. What is the Lewis concept of acids and bases ?
11. What is meant by ionization potential ? **(4×2=8)**

P.T.O.

SECTION – C

Short essay type. **Each** carries **3** marks. Answer **3** questions out of 5.

12. Discuss ion exchange and desalination methods for the purification of water.
13. Explain the terms effective nuclear charge and screening effect.
14. Explain sp^3d^2 and d^2sp^3 hybridization with examples.
15. Write a note on radiation pollution.
16. Calculate pH of the buffer obtained when 0.2 M acetic acid and 0.6 M sodium acetate are mixed to get 1L of solution (Ka for acetic acid is 1.3×10^{-5}). **(3×3=9)**

SECTION – D

Long essay type. **Each** carries **5** marks. Answer **2** questions out of 4.

17. Discuss the pollution of air by oxides of C, S and N.
18. How is the hydrogen spectrum explained on the basis of Bohr's theory ?
19. What is meant by orbital overlapping ? Explain the geometries of molecules associated with sp^3d and dsp^2 hybridization.
20. Derive the relation between Kw and Kh for salts of weak acid - weak base and weak acid-strong base. **(2×5=10)**

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