



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 $1/100^{\text{th}}$ 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)

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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 (K_a 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 K_w and K_h for salts of weak acid - weak base and weak acid-strong base. (2×5=10)