



K22U 3409

Reg. No. : .....

Name : .....

**I Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/  
Improvement) Examination, November 2022  
(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. According to Bohr's atomic model, the radius of the orbit is directly proportional to
2. How many atomic orbitals are present in the fourth energy level of an atom ?
3. The hybridization in  $\text{BeF}_2$  is
4. Which environmental segment interacts with all the other environmental segments ?
5. The degree of hydrolysis of a salt of a weak acid and a weak base in 0.1 M solution is found to be 30%. If the molarity of the solution is 0.2 M, the salt's percent hydrolysis should be

**SECTION – B**

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

6. What is Heisenberg's uncertainty principle ?
7. What is the order of wavelength associated with a 200 g golf ball moving at a speed of  $5 \text{ m s}^{-1}$  ?
8. What is ionization energy ? Write the conditions favoring the ionic bond formation.

P.T.O.



9. What is BOD ? How does BOD effect water quality ?
10. Write notes on acid rain.
11. At 25 degrees Celsius, the sodium salt of a weak monobasic organic acid is hydrolyzed to a 3 percent extent in its 0.1 M solution. What is the acid's dissociation constant, given that the ionic product of water at this temperature is  $10^{-14}$  ?

### SECTION – C

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

12. How atomic radii and ionization energy vary in periodic table ? Explain.
13. What is hydrogen bonding ? What are the conditions to form hydrogen bond ? What are the types of H-bonds ?
14. What is hybridization ? Explain  $sp^3d$  and  $sp^3d^2$  hybridization with examples.
15. Write in brief about the major segments of environment.
16. Find the pH of the solution obtained when 1.00 mol  $NH_3$  and 0.40 mol  $NH_4Cl$  are mixed to give 1 L of solution.  $K_b(NH_3) = 1.8 \times 10^{-5} \text{ mol L}^{-1}$ .

### SECTION – D

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

17. a) Explain atomic spectra of hydrogen.  
b) What are quantum numbers ? How is it related to orbitals ?
  18. Explain Born Haber cycle for the formation of NaCl.
  19. Briefly discuss air pollution.
  20. Discuss different concepts of acids and bases.
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