

TB141050

Reg. No.....

Name:

B.Sc. DEGREE(C.B.C.S.S.) EXAMINATION, NOVEMBER-2014
COMPLEMENTARY COURSE-FIRST SEMESTER
(FOR B.Sc. BOTANY, ZOOLOGY, FAMILY AND COMMUNITY SCIENCE)
CHE1BTAC-BASIC THEORETICAL AND ANALYTICAL CHEMISTRY

Time: Three Hours

Maximum Marks: 60

PART A

Answer all questions. Each question carries 1 mark.

1. Maximum number of electrons that can be placed in 2p subshell is -----
2. Principal quantum number determines -----.
3. Who put forward the proton transfer theory of acids and bases?
4. Which chromatographic technique is used in the demineralization of water?
5. What is absolute error?
6. EDTA is -----.
7. Define Internal energy.
8. State Second law of thermodynamics.

[8 x 1 = 8]

PART B

Answer any six questions. Each question carries 2 marks.

9. What are the applications of high performance liquid chromatography?
10. Write Henderson equation for acidic buffer?
11. Calculate the pH of a 1×10^{-9} M solution of HCl?
12. State Aufbau principle?
13. Distinguish between orbit and orbital?
14. Differentiate open system and closed system.

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15. For the reaction $\text{SOCl}_2 + \text{H}_2\text{O} \longrightarrow \text{SO}_2 + 2\text{HCl}$, ΔH is 49.4 KJ and ΔS is $336 \text{ J K}^{-1} \text{ mol}^{-1}$. Calculate ΔG at 30°C .
16. How will you purify camphor by sublimation?
17. What are precipitation titrations?
18. Differentiate molarity and molality.

[6 x 2 =12]

PART C

Answer any four questions. Each question carries 4 marks

19. Indicate the shapes of different d orbitals?
20. Explain common ion effect with suitable examples?
21. Write a note on ion exchange chromatography?
22. What are the common errors in quantitative analysis.
23. Calculate temperature at which water will be in equilibrium with water vapour. $\Delta H_{\text{vap}} = 45.62\text{KJ}$, $\Delta S_{\text{vap}} = 0.198 \text{ KJ K}^{-1} \text{ mol}^{-1}$
24. What are the requirements of titrimetric analysis.

[4 x 4=16]

PART D

Answer any 2 questions. Each question carries 12 marks

25. Explain (a) Ion Exchange chromatography (b) Thin Layer chromatography.
26. State Pauli's exclusion principle? Based on this principle show that the maximum number of electrons that can be accommodated in an orbital is 8 when $n= 2$.
27. i. Discuss the various separation techniques used in analytical chemistry
ii. How can you minimize errors?
28. (a) Explain free energy criteria for (i) spontaneous reaction (ii) equilibrium state (iii) non-spontaneous reaction.
(b) Define free energy. Derive $\Delta G = \Delta H - T \Delta S$