

Reg. No. :

Name :

Second Semester B.Sc. Degree Examination, May 2020

First Degree Programme under CBCSS

Chemistry

Complementary Course II for Physics / Geology

CH 1231.1/CH 1231.2 – PRINCIPLES OF CHEMISTRY II

(2013-2016 Admissions)

Time : 3 Hours

Max. Marks : 80

SECTION – A

(Very Short Answer types questions)

Answer **all**. Each questions carries **1** mark.

1. What are the different types of nuclear forces?
2. Write the nuclear equation for the emission of an alpha particle from Th^{232}
3. Define roentgen.
4. Arrange UV, IR, MW, and Radio waves in the increasing order of wave number.
5. How is n/p ratio related to the stability of nucleus?
6. What is an adsorption indicator?
7. Explain the term precision with respect to analytical determination.

8. Sketch the conduct metric titration curve for acetic acid X sodium hydroxide.
9. What is meant by ionic mobility?
10. Discuss the meaning of most probable value related to an analytical result.

(10 × 1 = 10 Marks)

SECTION – B
(Short Answer questions)

Answer **any eight** questions. Each carries **2** marks.

11. What is meant by permanganometry?
12. Name any two metal ion indicators.
13. Define Normality of an acid.
14. What is meant by ion conductance?
15. Give an explanation for the rusting of iron.
16. What is a concentration cell?
17. Define a normal mode of vibration.
18. Explain the rule of mutual exclusion.
19. Define chemical shift.
20. Explain spin- spin coupling.
21. Explain the term packing fraction
22. What is meant by artificial radioactivity?

(8 × 2 = 16 Marks)

SECTION – C
(Short Essay question)

Answer any **six** questions. Each question carries **4** marks.

23. State and explain Geiger- Nuttal rule.
24. The activity C^{14} of a carbonaceous material found to be one fourth of a fresh sample. Calculate the age of the material if the half life period of C^{14} is 5730 years.
25. Describe the radio carbon dating technique.
26. calculate and compare the energies of two radiations, one with wavelength 600nm and other with wave length 900 nm.
27. The IR absorption peak of HBr is found to be 3770 nm. Calculate the force constant of the H Br bond.
28. What is Raman shift? Give the classical theory of Raman effect.
29. Write a note on conductometric titrations.
30. Calculate the EMF at 300K of the cell $Zn(s)|Zn^{2+}(0.1M)||Cu^{2+}(0.1M)|Cu(s)$
 $E^{\circ} Zn/Zn^{2+}$ is $-0.76V$ and $E^{\circ} Cu/Cu^{2+}$ is $0.034V$.
31. Distinguish between accuracy and precision in respect to analytical results.

(6 × 4 = 24 Marks)

SECTION – D
(Long Essay Questions)

Answer any **two**. Each question carries **15** marks.

32. (a) Discuss the role and function of redox indicators in dichrometric titrations.
- (b) Discuss the quantum mechanical concept of Raman effect. Explain Stokes and antiStokes lines.

33. (a) Describe in detail how NMR spectroscopy can be used to distinguish benzene and phenol. **(10)**
- (b) Write a short note on radioactive series. **(5)**
34. (a) Explain the term ionic conductance. Discuss the Hittorf's method of determining transport numbers.
- (b) Write a note on neutron activation analysis.
35. (a) Discuss the biological effects of radiation giving emphasis to pathological and genetic damage.
- (b) Explain with an example each the role of stable isotope and radio isotopes as tracers.

(2 × 15 = 30 Marks)
