Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2017

BCHE1B01 – Theoretical & Inorganic Chemistry – I

(2017 Admission onwards)

Max. Time: 3 hours Max. Marks: 80

Section A: One Word Questions
Answer *all* questions.

1 ..... radio isotope is used for the treatment of thyroid cancer.

2 Give example for a desiccant in chemical laboratory.

3 A 2° standard among the following is

a) $K_2Cr_2O_7$, b) $KMnO_4$, c) Na_2CO_3, d) None of these

4 Give example for a chemistry journal published by ACS.

5 Oxidation number of sulphur in H_2SO_5 is .....

6 If $_{17}Cl^{35}$ undergo ($n.\alpha$) type nuclear reaction, the product will be .....

7 Wave length of light with wave number $3 \times 10^2 m^{-1}$ is.....

8 Wave nature of electron is verified by.....

9 The ligand denticity of EDTA is .....

10 The end product of Neptunium series is .....

(10 x 1 = 10 Marks)

Section B -Short Answer Questions
Answer *any ten* questions.

11 Theory can be modified with new observations. Justify with examples

12 Calculate the weight of oxalic acid present in 250ml of 0.3N solution.

13 $CuSO_4$ can be estimated iodometricaly. Explain

14 Write a balanced chemical equation for the permanganometric estimation of $FeSO_4$.

15 How we can recover the colour of gold ornaments, which are damaged by mercury?

16 Suggest first aid for inhalation of poisonous gases.

17 The kinetic energy of an electron is $4.55 \times 10^{-25} J$. Calculate its wavelength. (Given $m = 9.1 \times 10^{-31} Kg$, $h = 6.6 \times 10^{-34} Js$)

18 After 20 days, 25% of a radioactive substance remains. Calculate $t_{½}$.

19 Explain the use and importance of moderators in nuclear reactors?

20 Write a note on the separation of isotopes by gaseous diffusion.

21 What are the important inferences of Gold foil experiment?

22 Give examples for the use of radio isotopes in medicinal field.

(10 x 2 = 20 Marks)

Section C –Paragraph Questions
Answer any *five questions*.

23 Scientific hypothesis can originate from different kinds of thought process. Justify

24 Describe the principle regarding choice of suitable indicators in acid base titration.

25 Write note on *N/P* ratio on nuclear stability.

26 Explain double burette method in volumetric analysis.

27 Explain nuclear fission and fusion reactions.

28 Explain a method for detecting the age of minerals and rocks.

29 Discuss how Bohr theory explain the formation of spectrum of hydrogen.

30 Derive the expression for the velocity, energy and radius of n^{th} Bohr orbit in a hydrogen atom.

(5 x 6 = 30 Marks)

Section D –Essay Questions
Answer any *two questions*.

31 a) Write note on laboratory hygiene and safety. 6 marks

b) What are the important safeties signs in chemical laboratory 4 marks

32 Explain the principle behind

a) Redox indicators, b) Adsorption indicators and c) Complexometric indicators.

4+3+3 marks

33 a) Chemistry is an interdisciplinary science. Justify with example 6 marks

b) What are the major components of a research project report? 4 marks

34 a) Explain the working of Aston's mass spectrograph. 6 marks

b) Write a note on the use of radio isotopes in agriculture. 4 marks

(2 x 10 = 20 Marks)

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1B1N17243 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2017

BCHE1C01 – General Chemistry

(2017 Admission onwards)

Max. Time: 3 hours Max. Marks: 64

SECTION A (One word)

Answer all questions. Each question carries 1 mark

1. "The sceptical Chymist" is written by .....
2. The dissociation of acetic acid is suppressed by the addition of sodium acetate is due to the phenomenon of .....
3. The macrocyclic ligand present in cobalamine complex is.....
4. The conjugate base of HF is.....
5. The size of Na atom is .....than that of Na^+
6. In acetylene the carbon atom are in .....hybridization
7. India's first nuclear reactor is .....
8. The oxidation state of Fe in Oxyhemoglobin is.....
9. Which is the indicator used for the titration of oxalic acid Vs NaOH?
10. The transition metal found to be largest amount in human is.....

(10 x 1= 10 Marks)

SECTION B (Short Answer)

Answer any seven questions. Each question carries 2 marks

11. Draw the shape of NH_4^+ and SF_4 in accordance with VSEPR theory.
12. Write Schrödinger wave equation and explain the terms.
13. What is the advantage of double burette method over single burette titration?
14. Explain the electronic concept of oxidation and reduction with examples.
15. State group displacement law.
16. Calculate the wave number of radiation emitted in second line of Balmer series in hydrogen spectra.
17. Define lattice energy and what are the factors which effect lattice energy?
18. Calculate the normality of aqueous solution produced by dissolution of 12.3g crystalline oxalic acid in 500 ml water.
19. Why EDTA titrations usually done using buffered solutions of near or above p^H 10?
20. What is binding energy and how binding energy is related to the stability of nucleus?

(7 x 2 = 14 Marks)

SECTION B (Paragraph)

Answer any four questions. Each question carries 5 marks

21. Discuss the merits of long form of periodic table.
22. Explain Equivalent mass of acid and base with suitable examples.
23. Discuss the hybridization and shape of SF_6 and IF_7 using VSEPR theory.
24. What are isotones? Give some point of distinction between isotope, isobars and isotones.
25. Describe the radio carbon dating technique.
26. Discuss the role of metal ions in biochemical process with suitable example.

(4 x 5 = 20 Marks)

SECTION D (Essay)

Answer any two questions. Each question carries 10 marks

27. Discuss the following.
    a) The structure of hemoglobin.
    b) Oxygen transportation mechanism by hemoglobin.
28. a) Briefly outline the application of solubility product and common ion effect in the separation of cations in inorganic qualitative analysis.
    b) A solution contains Cu^{2+} and Ba^{2+} ions. How would you separate the ions and identify them.
29. What are the postulates of molecular orbital theory? Construct MO diagram of O_2 and account on its magnetic behavior and bond order.
30. a) Define ionization enthalpy and discuss the factors determine the ionization enthalpy of an element.
    b) Explain the variation of ionization enthalpy along a period and down a group of the periodic table.

(2 x 10 = 20 Marks)