1N18016 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2018

BCHE1B01 – Theoretical & Inorganic Chemistry – I

(2017 Admission onwards)

ax. Time: 3 hours Max. Marks: 80

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

1 Iodine dissolves readily in aq. KI due to the formation of …….. ion.
2 ……. can be used as antidote in metal poisoning.
3 In a research project, the existing level of knowledge on the subject is obtained by ……
4 Write Debrolie equation.
5 Concordance of a series of measurements of the same quantity is called ….
6 In 1974 *Smiling Buddha* nuclear test, India used ……. as the fissionable material.
7 The number of α particles emitted during the transformation of $_{93}Np^{237}$ to $_{83}Bi^{209}$ is …..
8 Number of significant figures in 0.0008 is
9 $_{9}F^{19}$ after (n, α) type nuclear reaction will give
10 In dichrometry the oxidation number of Cr changes from …….. to ……..

(10 x 1 = 10 Marks)

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

11 Falsification of hypothesis is an effective method in scientific research. Justify
12 Calculate the normality of solution when 8.23g of crystalline oxalic acid is made up to 100ml in a standard flask.
13 20 ml NaOH solution of 0.2 N is pipetted from a 250 ml standard flask and transferred to 100ml standard flask and made up to the mark. What is the normality of resultant solution?
14 Initial heating is required for the permanganometric estimation of oxalic acid. Give reason
15 With balanced chemical equation explain the iodometric estimation of $KMnO_4$.
16 Give examples for the industrial applications of radio isotopes.
17 Explain the stability and abundance of iron in terms of binding energy.
18 Explain the de Broglie's concept of matter waves.
19 Calculate the kinetic energy of photoelectron ejected when radiation of wavelength 5400Å falls on the surface of a metal. (Given threshold wavelength 6700Å, $h = 6.626 \times 10^{-34}$ *Js*)
20 Laboratory personals should aware of MSDS of a chemical before its use. Justify
21 Describe a method for the proper disposal of mercury spillage.
22 What are adsorption indicators ?.

(10 x 2 = 20 Marks)

Section C –Paragraph Questions

Answer any *five questions*.

23 Scientific research is interdisciplinary in nature. Justify

24 Describe the concept behind complexometric titrations.

25 Explain the theory behind adsorption indicators with example.

26 ^{238}U and ^{206}Pb are present in a mineral in the ratio 5:8. Calculate the age of the mineral. (Given $t_{1/2}$ of ^{238}U is 4.5×10^9 years).

27 Explain the stability of nucleus with a reference to meson exchange.

28 Discuss the major safety signs on chemical bottles used in laboratory.

29 Write a procedure for the estimation of HCl using double burette method. What are its advantages?

30 Describe the theories behind acid-base indicators.

(5 x 6 = 30 Marks)

Section D –Essay Questions

Answer any *two questions*.

31 What are the merits and demerits of Bohr model of atom? Explain the origin of differer series of lines in hydrogen spectrum.

10 mark

32 Describe the safety measures to be taken for the storage and handling of chemicals.

10 mar

33 a) Scientific revolutions represents a turning point in world history. Justify with example

4 mar

b) Explain the use of titration curves for the selection of indicators in acid-base titrations

6 mar

34 a) Distinguish between nuclear fission and fusion.

6 mar

b) Explain the concept of Breeder reactor.

4 mar

(2 x 10 = 20 Marks

16

017 (Pages : 2) Reg. No:.....

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Degree Examination, November 2018

BCHE1C01 – General Chemistry

(2016 Admission onwards)

Max. Time: 3 hours Max. Marks: 64

Section A (One word)

Answer all questions. Each question carries 1 mark

IGCAR is located in ..... of TamilNadu.

The oxidation number of Co in Vitamin B_{12} is .....

If the observed value is 0.5556 and true value is 0.5886, relative error in % will be .....

Intravenous administration of a chemical solution of .... is used to treat acute and chronic Pb poisoning.

..... is an example for a globular protein.

A 1^{o} standard among the following is

a) $KMnO_4$ b) $K_2Cr_2O_7$ c) NaOH d) acetic acid

A subshell with $n = 5$ and $l = 2$ is designated as

In Born- Haber cycle, lattice energy is calculated based on .....

Among sp, sp^2 and sp^3 hybridisation gives the maximum electronegativity for .....

Formula for Prussian blue is .....

(10 x 1 = 10)

Section B (Short answer)

Answer any seven question. Each question carries 2 marks

Na_2CO_3 can be considered as a base in water. Justify your answer.

Write balanced chemical equation for the reaction of $KMnO_4$ with oxalic acid.

Explain conjugate acid base pairs with example.

Draw the structure of methyl orange and phenolphthalein.

Copper(I) is diamagnetic whereas copper(II)is paramagnetic. Why?

Distinguish between ionic bond and covalent bond.

Explain the structure of PCl_5 with the help of hybridization.

Calculate the wavelength of the spectral line obtained in the Lyman series if the electron in the hydrogen atom has been excited to the 3^{rd} energy level.

With the help of MOT prove that O_2 is paramagnetic.

Draw the structure of $\pi 2P_x$ and $\pi^* 2P_x$ molecular orbitals.

(7 x 2 = 14)

Section C (Paragraph)

Answer any four questions. Each question carries 5 marks

21. Explain the working of nuclear reactor.
22. Elucidate the mechanism of oxygen transport in body.
23. As the temperature increases from 0°C to 4°C the density of water increases. Justify
24. Explain the advantages of double burette method in volumetric analysis.
25. A sample of H_2SO_4 contains 80% w/w acid. How much volume of acid is needed to prepare 5L of 1M solution?
26. Define ionization energy. What are the factors affecting the ionization enthalpy of an elemen (5

Section D (Essay)

Answer any two questions. Each question carries 10 marks

27. a) State the postulates of VSEPRT and explain the structure of XeF_6 & XeF_4. (5
    b) Filling up of electron in atomic orbital is governed by three rules. Discuss (5
28. a) Discuss briefly the principle underlying the separation of cations into groups in qualitativ
    b) Describe the theory of metallochromic indicators in complexometric titrations. (
29. a) Give brief discussion on iodimetry and iodometry (
    b) Explain the principle regarding the choice of suitable indicators in acid - base titrations. (
30. a) Explain the terms mass defect and binding energy in nuclear chemistry.
    b) Write note on nuclear forces.

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