Roll No. ..... Total No. of Printed Pages : 4

Code No. : B04-402 (C)

Fourth Semester Online Examination, May-June, 2022

M. Sc. CHEMISTRY

Paper - IV (Elective - C)

CHEMICAL KINETICS AND NUCLEAR CHEMISTRY

Time : Three Hours] [Maximum Marks : 80

Note : ● Part A and B of each equation in each unit consist of very short answer type questions which are to be answered in one or two sentences.

● Part C (Short answer type) and D (Long answer type) of each question should be answered within the word limit 200-250 and 400-450 words.

Unit-I

1. (A) What is the kinetic effect of increasing temperature from 20°C to 30°C. 2

(B) Write Wegscheider's test for side-reactions. 2

(C) Show how does pH effects a chemical reaction ? 4

Or

The value of specific rate constants for decomposition of N_2O_5 is 3.46×10^{-5} at 25°C and 4.67×10^{-3} at 65°C. Calculate the energy of actication for the reaction.

(D) What are opposing reactions ? Discuss the kinetics of opposing reactions. 12

Or

Write short notes on :

(i) Engyme catalysis,

(ii) Miceller catalysis

Unit-II

2. (A) Define Primary Isotopic Effect. 2

(B) Write Grunwald and Soul Weinstain equation. 2

(C) Explain Tunnel effect. 4

Or

Explain Zucker-Hammett hypothesis.

(D) Describe the effect of solvent on reaction rates of SN_1 and SN_2 reactions. 12

Or

Describe linear free energy relationship. Why are Hammett's relations called linear free energy relationships.

Unit-III

3. (A) What are fission neutrons ? 2

(B) Define nuclear fusion. 2

(C) Explain semi-empirical equation. 4

Or

Describe liquid drop model of nucleus.

(D) Explain nuclear fission. How does mass, energy and charge distribution take place in a fission. 12

Or

Write notes on following :

(i) Magic Numbers

(ii) Breader Reactor

Unit-IV

4. (A) What are tracers ? 2

(B) Define Half life of radioactive materials. 2

(C) Write a brief note on Geiger-Muller counters. 4

Or

How does radioactivity measured by Scintillation counter.

(D) Describe the application of radioisotopes on reaction mechanism and structure determinations. 12

Or

Describe the kinetics of radioactive decay.

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