

(6 pages)

Reg. No. :

Code No. : 6863

Sub. Code : KCHM 43

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2018.

Fourth Semester

Chemistry

PHYSICAL CHEMISTRY – IV

(For those who joined in July 2016 – 2017)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. According to collision theory
 - (a) All collisions are ineffective
 - (b) All collisions cause energy loss
 - (c) Collisions are violent
 - (d) Only high energy molecules have enough energy to react

2. Which of the following is not a category of catalysis?

- (a) Homogeneous
 - (b) Heterogeneous
 - (c) Artificial
 - (d) Enzymatic

3. Select the incorrect statement from the following options.

- (a) In the micelle formation, the water soluble heads are directed towards the centre
 - (b) In the micelle formation, the water soluble heads are on the surface in contact with the water
 - (c) In the micelle formation, the water insoluble tails are directed towards the centre
 - (d) None of the above

4. Which of the following is an example of homogeneous catalysis?

- (a) Enzyme catalysis
 - (b) Hardening of animal and vegetable oils
 - (c) Haber's process
 - (d) Cracking of heavy oils for synthesis of gasoline

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5. Process in which catalyst has a different phase to a reaction mixture, this process is known as
- (a) Homogeneous catalysis
 - (b) Heterogeneous catalysis
 - (c) Hypergeneous catalysis
 - (d) Hypogeneuous catalysis
6. The fastest enzyme is
- (a) Pepsin
 - (b) Carbonic anhydrase
 - (c) DNA gyrase
 - (d) DNA Polymerase
7. The enzymes which form the peptide bond _____ is known as
- (a) Carbonic anhydrase
 - (b) Peptidase
 - (c) Carbohydrase
 - (d) Peptidyl transferase
8. Graphite can be described as
- (a) Hard and crystalline
 - (b) Soft and slippery
 - (c) A dark liquid
 - (d) Made only of carbon and hydrogen atoms

9. Zeolites are complex compound of
- (a) Aluminium and lime
 - (b) Silica and soda
 - (c) Aluminium, silica and soda
 - (d) Lime and soda
10. The chemical formula of zeolite is
- (a) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$
 - (b) $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$
 - (c) $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot x\text{SiO}_2 \cdot y\text{H}_2\text{O}$
 - (d) $\text{Na}_2\text{Al}_2\text{O}$

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Compare ARR theory and collision theory.
- Or
- (b) Describe the Lindemann-Hinshelwood theory of unimolecular reactions.
12. (a) Describe the principle of flash photolysis for the study of fast reactions.
- Or
- (b) Distinguish between primary and secondary kinetic salt effect.



13. (a) Derive Freundlich adsorption isotherm.

Or

(b) Obtain the Gibbs adsorption isotherm equation.

14. (a) Discuss about anticancer and antiarthritic agents.

Or

(b) What do you mean by chelate therapy?

15. (a) Differentiate fullerenes and fullerides.

Or

(b) Write a short note on zeolites.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the kinetics of H_2 - Br_2 reactions.

Or

(b) Compare Arrhenius and collision theories.

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17. (a) Elaborate NMR and ESR methods of studying fast reactions.

Or

(b) Describe the relaxation techniques of studying fast reactions.

18. (a) What are the postulates of BET theory? Write advantages over Langmuir adsorption theory?

Or

(b) Explain the various types of adsorption isotherm curves.

19. (a) Discuss how metal complexes are used as probe of nucleic acids.

Or

(b) Write extensively about different types of copper proteins and enzymes.

20. (a) Briefly discuss about the different methods of synthesis of inorganic materials.

Or

(b) Discuss about the intercalation compounds of transition metal disulphides and graphite.

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