Department of Computer Science and Engineering

B. Sc. (Honours) 2nd Year 1st Semester Final Examination-2019

Session: 2017-2018

Course Code: CHM 2121

Course Title: Chemistry

(N. B.: The figures in the right margin indicate full marks of each question.)
Answer any **FIVE** questions.

Time: 3 Hours Full Marks: 50

1.	(a)	What do you mean by Voltaic cell? Discuss about the structure and reactions of Daniel cell.	1+3
	(b)	State and explain the Faraday's laws of electrolysis.	2+2
	(c)	Define electrochemical synthesis.	2
2.	(a)	What is first order reaction? Derive the rate equation of a first order reaction.	1+3
	(b)	What are K_c and K_p? The value of K_p at 25°C for the reaction $2NO\ (g) + Cl_2\ (g) \leftrightarrow 2NOCl\ (g)$ is 1.9×10^3 atm^{-1}. Calculate the value of K_c at the same temperature.	1+3
	(c)	Distinguish molecularity and order of a chemical reaction?	2
3.	(a)	What are colloids? How are they classified?	1+3
	(b)	Write down the differences among emulsion, gel and suspension.	4
	(c)	Define adsorption and absorption with example.	2
4.	(a)	Discuss the Bohr's theory of atomic model.	4
	(b)	On the basis of hybridization, deduce the shape of the following molecules and predict the bond angle in each case: BF_3, H_2O, CH_4.	4
	(c)	Write the electronic configuration of the following elements or ion: Cr, Cr^{3+}, Fe, Fe^{2+}.	2
5.	(a)	What is covalent bond? Discuss the potential energy curve to form a covalent bond between two atoms A and B.	1+3
	(b)	Write the formula for each of the following complexes: (i) hexamminecobalt(III) chloride (ii) sodium tetrachlorozincate(II) (iii) potassium hexacyano ferrate (II) (iv) μ-dihydro tetrakis oxalato chromate (III)	4
	(c)	Explain why metals are good conductors.	2
6.	(a)	What do you mean by coordination compounds? Classify ligands with example.	1+3
	(b)	Does O_2 exist? Explain this with the help molecular orbital theory.	1+3
	(c)	Transition metals can show variable valency-explain.	2
7.		(a) Define activation energy and reaction energy with energy profile diagram in a chemical reaction.	3
		(b) What is half-life period? The half-life period of a substance in a first order reaction is 45 minutes. Calculate the rate constant.	3
		(c) Write the rate law and order of the following reactions: I) $H_2+I_2 \longrightarrow 2HI$ II) $2NO_2 \longrightarrow 2NO+O_2$ III) $2NO+2H_2 \longrightarrow N_2+2H_2O$	4

Department of Computer Science and Engineering

B. Sc. (Honours) 2nd Year 1st Semester Final Examination-2019

Session: 2017-2018

Course Code: CHM 2121

Course Title: Chemistry

(N. B.: The figures in the right margin indicate full marks of each question.)
Answer any **FIVE** questions.

Time: 3 Hours | Full Marks: 50

1.	(a)	What do you mean by Voltaic cell? Discuss about the structure and reactions of Daniel cell.	1+3
	(b)	State and explain the Faraday's laws of electrolysis.	2+2
	(c)	Define electrochemical synthesis.	2
2.	(a)	What is first order reaction? Derive the rate equation of a first order reaction.	1+3
	(b)	What are K_c and K_p? The value of K_p at 25°C for the reaction $2NO\ (g) + Cl_2\ (g) \leftrightarrow 2NOCl\ (g)$ is 1.9×10^3 atm $^{-1}$. Calculate the value of K_c at the same temperature.	1+3
	(c)	Distinguish molecularity and order of a chemical reaction?	2
3.	(a)	What are colloids? How are they classified?	1+3
	(b)	Write down the differences among emulsion, gel and suspension.	4
	(c)	Define adsorption and absorption with example.	2
4.	(a)	Discuss the Bohr's theory of atomic model.	4
	(b)	On the basis of hybridization, deduce the shape of the following molecules and predict the bond angle in each case: BF_3, H_2O, CH_4.	4
	(c)	Write the electronic configuration of the following elements or ion: Cr, Cr^{3+}, Fe, Fe^{2+}.	2
5.	(a)	What is covalent bond? Discuss the potential energy curve to form a covalent bond between two atoms A and B.	1+3
	(b)	Write the formula for each of the following complexes: (i) hexamminecobalt(III) chloride (ii) sodium tetrachlorozincate(II) (iii) potassium hexacyano ferrate (II) (iv) μ-dihydro tetrakis oxalato chromate (III)	4
	(c)	Explain why metals are good conductors.	2
6.	(a)	What do you mean by coordination compounds? Classify ligands with example.	1+3
	(b)	Does O_2 exist? Explain this with the help molecular orbital theory.	1+3
	(c)	Transition metals can show variable valency-explain.	2
7.		(a) Define activation energy and reaction energy with energy profile diagram in a chemical reaction.	3
		(b) What is half-life period? The half-life period of a substance in a first order reaction is 45 minutes. Calculate the rate constant.	3
		(c) Write the rate law and order of the following reactions: I) $H_2+I_2 \longrightarrow 2HI$ II) $2NO_2 \longrightarrow 2NO+O_2$ III) $2NO+2H_2 \longrightarrow N_2+2H_2O$	4

Department of Computer Science and Engineering

B. Sc. (Honours) 2nd Year 1st Semester Final Examination-2019

Session: 2017-2018

Course Code: CHM 2121

Course Title: Chemistry

(N. B.: The figures in the right margin indicate full marks of each question.)
Answer any **FIVE** questions.

Time: 3 Hours Full Marks: 50

1.	(a)	What do you mean by Voltaic cell? Discuss about the structure and reactions of Daniel cell.	1+3
	(b)	State and explain the Faraday's laws of electrolysis.	2+2
	(c)	Define electrochemical synthesis.	2
2.	(a)	What is first order reaction? Derive the rate equation of a first order reaction.	1+3
	(b)	What are K_c and K_p? The value of K_p at 25°C for the reaction $2NO\ (g) + Cl_2\ (g) \leftrightarrow 2NOCl\ (g)$ is $1.9 \times 10^3\ atm^{-1}$. Calculate the value of K_c at the same temperature.	1+3
	(c)	Distinguish molecularity and order of a chemical reaction?	2
3.	(a)	What are colloids? How are they classified?	1+3
	(b)	Write down the differences among emulsion, gel and suspension.	4
	(c)	Define adsorption and absorption with example.	2
4.	(a)	Discuss the Bohr's theory of atomic model.	4
	(b)	On the basis of hybridization, deduce the shape of the following molecules and predict the bond angle in each case: BF_3, H_2O, CH_4.	4
	(c)	Write the electronic configuration of the following elements or ion: Cr, Cr^{2+}, Fe, Fe^{2+}.	2
5.	(a)	What is covalent bond? Discuss the potential energy curve to form a covalent bond between two atoms A and B.	1+3
	(b)	Write the formula for each of the following complexes: (i) hexamminecobalt(III) chloride (ii) sodium tetrachlorozincate(II) (iii) potassium hexacyano ferrate (II) (iv) μ-dihydro tetrakis oxalato chromate (III)	4
	(c)	Explain why metals are good conductors.	2
6.	(a)	What do you mean by coordination compounds? Classify ligands with example.	1+3
	(b)	Does O_2 exist? Explain this with the help molecular orbital theory.	1+3
	(c)	Transition metals can show variable valency-explain.	2
7.		(a) Define activation energy and reaction energy with energy profile diagram in a chemical reaction.	3
		(b) What is half-life period? The half-life period of a substance in a first order reaction is 45 minutes. Calculate the rate constant.	3
		(c) Write the rate law and order of the following reactions:	4
		I) $H_2+I_2 \longrightarrow 2HI$	
		II) $2NO_2 \longrightarrow 2NO+O_2$	
		III) $2NO+2H_2 \longrightarrow N_2+2H_2O$	

Department of Computer Science and Engineering

B. Sc. (Honours) 2nd Year 1st Semester Final Examination-2019

Session: 2017-2018

Course Code: CHM 2121

Course Title: Chemistry

(N. B.: The figures in the right margin indicate full marks of each question.)
Answer any **FIVE** questions.

Time: 3 Hours Full Marks: 50

1.	(a)	What do you mean by Voltaic cell? Discuss about the structure and reactions of Daniel cell.	1+3
	(b)	State and explain the Faraday's laws of electrolysis.	2+2
	(c)	Define electrochemical synthesis.	2
2.	(a)	What is first order reaction? Derive the rate equation of a first order reaction.	1+3
	(b)	What are K_c and K_p? The value of K_p at 25°C for the reaction $2NO\ (g) + Cl_2\ (g) \leftrightarrow 2NOCl\ (g)$ is 1.9×10^3 atm^{-1}. Calculate the value of K_c at the same temperature.	1+3
	(c)	Distinguish molecularity and order of a chemical reaction?	2
3.	(a)	What are colloids? How are they classified?	1+3
	(b)	Write down the differences among emulsion, gel and suspension.	4
	(c)	Define adsorption and absorption with example.	2
4.	(a)	Discuss the Bohr's theory of atomic model.	4
	(b)	On the basis of hybridization, deduce the shape of the following molecules and predict the bond angle in each case: BF_3, H_2O, CH_4	4
	(c)	Write the electronic configuration of the following elements or ion: Cr, Cr^{3+}, Fe, Fe^{2+}.	2
5.	(a)	What is covalent bond? Discuss the potential energy curve to form a covalent bond between two atoms A and B.	1+3
	(b)	Write the formula for each of the following complexes: (i) hexamminecobalt(III) chloride (ii) sodium tetrachlorozincate(II) (iii) potassium hexacyano ferrate (II) (iv) μ-dihydro tetrakis oxalato chromate (III)	4
	(c)	Explain why metals are good conductors.	2
6.	(a)	What do you mean by coordination compounds? Classify ligands with example.	1+3
	(b)	Does O_2 exist? Explain this with the help molecular orbital theory.	1+3
	(c)	Transition metals can show variable valency-explain.	2
7.		(a) Define activation energy and reaction energy with energy profile diagram in a chemical reaction.	3
		(b) What is half-life period? The half-life period of a substance in a first order reaction is 45 minutes. Calculate the rate constant.	3
		(c) Write the rate law and order of the following reactions: I) $H_2+I_2 \longrightarrow 2HI$ II) $2NO_2 \longrightarrow 2NO+O_2$ III) $2NO+2H_2 \longrightarrow N_2+2H_2O$	4

Department of Computer Science and Engineering

B. Sc. (Honours) 2nd Year 1st Semester Final Examination-2019

Session: 2017-2018

Course Code: CHM 2121

Course Title: Chemistry

(N. B.: The figures in the right margin indicate full marks of each question.)
Answer any **FIVE** questions.

Time: 3 Hours Full Marks: 50

1. (a) What do you mean by Voltaic cell? Discuss about the structure and reactions of Daniel cell. 1+3
   (b) State and explain the Faraday's laws of electrolysis. 2+2
   (c) Define electrochemical synthesis. 2

2. (a) What is first order reaction? Derive the rate equation of a first order reaction. 1+3
   (b) What are K_c and K_p? The value of K_p at 25°C for the reaction $2NO\ (g) + Cl_2\ (g) \leftrightarrow 2NOCl\ (g)$ is $1.9 \times 10^3\ atm^{-1}$. Calculate the value of K_c at the same temperature. 1+3
   (c) Distinguish molecularity and order of a chemical reaction? 2

3. (a) What are colloids? How are they classified? 1+3
   (b) Write down the differences among emulsion, gel and suspension. 4
   (c) Define adsorption and absorption with example. 2

4. (a) Discuss the Bohr's theory of atomic model. 4
   (b) On the basis of hybridization, deduce the shape of the following molecules and predict the bond angle in each case: BF_3, H_2O, CH_4. 4
   (c) Write the electronic configuration of the following elements or ion: Cr, Cr^{3+}, Fe, Fe^{2+}. 2

5. (a) What is covalent bond? Discuss the potential energy curve to form a covalent bond between two atoms A and B. 1+3
   (b) Write the formula for each of the following complexes: 4
      (i) hexamminecobalt(III) chloride
      (ii) sodium tetrachlorozincate(II)
      (iii) potassium hexacyano ferrate (II)
      (iv) μ-dihydro tetrakis oxalato chromate (III)
   (c) Explain why metals are good conductors. 2

6. (a) What do you mean by coordination compounds? Classify ligands with example. 1+3
   (b) Does O_2 exist? Explain this with the help molecular orbital theory. 1+3
   (c) Transition metals can show variable valency-explain. 2

7. (a) Define activation energy and reaction energy with energy profile diagram in a chemical reaction. 3
   (b) What is half-life period? The half-life period of a substance in a first order reaction is 45 minutes. Calculate the rate constant. 3
   (c) Write the rate law and order of the following reactions: 4
      I) $H_2 + I_2 \longrightarrow 2HI$
      II) $2NO_2 \longrightarrow 2NO + O_2$
      III) $2NO + 2H_2 \longrightarrow N_2 + 2H_2O$