

GOVERNMENT COLLEGE UNIVERSITY, FAISALABAD

B.Sc (Part-I)

Annual 2017

Subject: Chemistry

PAPER-A

Title: Physical Chemistry

Max. Marks: 35

Note : Attempt any five questions. Furthermore, it is compulsory to attempt at least two questions from each section. Each question carries 7 marks.

SECTION-I

Q. 1. (a) Differentiate given functions w.r.t x

(i) $y = \sin 2x + \cos 3x^3$

(ii) $y = (x^2 + 6x + 7)(2x^9 + 3x^5 + 7x + 7)$

(b) Integrate following functions (i) $\int x^2 \cos 4x^4 dx$ (ii) $\int \frac{dx}{\sqrt{ax+b}}$

Q. 2 (a). What are assumptions of kinetic theory of gases and how they are justified?

(b) Calculate the angle at which first order diffraction occurs when X-Rays of 1.54nm are diffracted from crystal while interplanar distance is 3.95nm.

Q. No.3. (a) Derive an expression for entropy of an ideal gas when temperature and pressure undergo change. (b) The first order rate constant for the decomposition of N_2O_5 is 5.2×10^{-6} at $0^\circ C$. If energy of activation is 6220 Joule per mole, calculate rate constant of this reaction at $25^\circ C$.

Q. NO. 4. (a). Derive mathematical expression for calculation of rate constant for second order reaction with different initial concentration of reactants. (b) State and explain second law of thermodynamics.

SECTION-II

Q. NO. 5. (a). Consider molecule of 1,3-Butadiene as one dimensional box having length

$0.6 \times 10^{-9} m$. How much energy is absorbed if electron jumps from $n=2$ to $n=4$ (Hint: $E = n^2 h^2 / 8ma^2$) (b) How much grams of glucose are required to prepare $600 cm^3$ of 0.45 molar solutions

Q. No. 6. (a) .State and explain Heisenberg's uncertainty principle (b) How elevation of boiling point is used to calculate molecular mass of solute

Q. No. 7 (a). Derive Langmuir adsorption isotherm stating the assumption on which it is based. Under what conditions Langmuir adsorption isotherm is reduced to Freundlich adsorption isotherm. (b) What is cell constant? How it is experimentally determined. Calculate cell constant of N/50 HCl solution if specific conductance of solution is $0.00233 S cm^{-1}$ at $25^\circ C$ while resistance of cell is 100 Ohms.

Q. No.8. (a) Compare physical and Chemical adsorption.

(b) How Arrhenius theory explains behavior of electrolytic solution.

Note for Paper Setter: It is the choice of examiner to either set a full question from a single chapter or to mix two or more chapters for a question.

MODEL PAPER

Roll No.-----

GOVERNMENT COLLEGE UNIVERSITY, FAISALABAD

B.Sc

Part-I

Annual 2017

Subject: Chemistry

PAPER-B

Title: Inorganic Chemistry

Max. Marks: 35

Time Allowed = 03:00

Hours Pass Marks: 33%

Note: Attempt any five questions:

Q.No.1. What is periodic law? Describe the features of the modern periodic table. (07)

Q.No.2. a)What are various types of radiation given off by a radioactive element. (04)

b)Why certain isotopes are stable while other are radioactive? (03)

Q.No.3. Discuss the features of CFT, d-orbital splitting for various common geometries. (07)

Q.No.4.What is leveling effect?

Q.No.5. a)How does VBT explain the structures of molecules? (03)

b) How does the molecular orbital theory differ from VBT? (04)

Q.No.6. What is law of mass action? Give its applications (07)

Q.No.7. Give the classifications of chromatographic techniques. (07)

Q.No.8. Explain any two from the followings (3.5,3.5)

i) Metallic bonds ii) SHAB Principle iii) Carbon dating iv) Chelates

Note for Paper Setter: It is the choice of examiner to either set a full question from a single chapter or to mix two or more chapters for a question.

MODEL PAPER

Roll No.-----

GOVERNMENT COLLEGE UNIVERSITY, FAISALABAD

B.Sc.

Part-II

Annual 2017

Subject: Chemistry

PAPER-A

Title: Organic Chemistry

Max. Marks: 35

Time Allowed = 03:00 Hours

Pass Marks: 33%

Note: Attempt any five questions: It is compulsory to attempt at least two questions from each section.

Section-I

Q.No.1. Describe in detail the phenomenon of 'Resonance Effect' and its influence on the properties of organic compounds. (7)

Q.No.2. What is Freund Synthesis? Prepare any two cycloalkanes using this method. (7)

Q.No.3. Describe in detail the 'Freidel-Craft's alkylation and acylation reaction' along with mechanisms. Prepare acetophenone and toluene starting from benzene using this method. (7)

Q.No.4. Write a detailed note on the 'Applications of Grignard's Reagent' in Organic Synthesis. (7)

Section-II

Q.No.5. Discuss the mechanism of following 'Named Reactions': (7)

(I) Wittig Reaction (II) Cannizaro's reaction

Q.No.6. Describe any three routes for the synthesis of ethers. (7)

Q.No.7. Describe Koehl reaction along with mechanism. (7)

Q.No.8. Write a note on the chemical reactions of diols and triols. (7)

MODEL PAPER

Roll No.-----

GOVERNMENT COLLEGE UNIVERSITY, FAISALABAD

B.Sc.

Part-II

Annual 2017

Subject: Chemistry

PAPER-B

Title: Applied Chemistry

Max. Marks: 35

Time Allowed = 03:00 Hours

Pass Marks: 33%

Note: Attempt any five questions: It is compulsory to attempt at least two questions from each section. All questions carry equal marks *i.e.*, 7.

Section-I

Q.No.1 What is Flame Emission Spectroscopy? Describe basic principle and instrumentation.

Q.No.2. What is acid rain? Describe in detail its impact on the environment.

Q.No.3. Write in detail the applications of solvent extraction in chemistry.

Q.No.4. Explain standard deviation and its uses in chemistry.

Section-II

Q.No.5. Write a note on sugar industry, describe its raw materials, manufacturing process and flow sheet diagram

Q.No.6. Explain cell wall polysaccharides in detail.

Q.No.7. Describe the significance of lipids in biological membranes.

Q.No.8. What are proteins? Describe their classifications and biological significances.