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**B.Sc. (Part-III) Semester-VI****Examination, March 2024.****INORGANIC CHEMISTRY (Paper-XIII)****Sub. Code : 81674****Day and Date: Tuesday, 26-03-2024****Total Marks: 40****Time: 02.30 p.m. to 04.30 p.m.**

- Instructions:**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Draw neat and labelled diagrams wherever necessary.

**Q.1 a) Answer the following in one sentence. (4)**

- 1) Give any two control rods used in heavy water nuclear reactors.
- 2) What is lanthanide contraction?
- 3) Which metal is involved in blood clotting?
- 4) Define calcination.

**b) Choose the correct alternative and rewrite the sentence. (4)**

- 1) In dissociative mechanism, bond ..... is predominant.  
(A) breaking (B) partial breaking  
(C) not breaking (D) making
- 2) Usually  $\text{Na}^+$  is extracellular while ..... is intracellular in biological process.  
(A)  $\text{Mg}^{++}$  (B)  $\text{K}^+$   
(C)  $\text{Ca}^{++}$  (D)  $\text{Na}^{++}$
- 3) Artificial transmutation was first reported by .....  
(A) Chadwick (B) Rutherford and Chadwick  
(C) Blackett (D) Rutherford



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**B.Sc. (Part - III) (Semester - VI) (CBCS)**

**Examination, March - 2024**

**CHEMISTRY**

**Organic Chemistry (Paper-XIV)**

**Sub. Code : 81675**

**Day and Date : Wednesday, 27-03-2024**

**Total Marks : 40**

**Time : 02.30 p.m. to 04.30 p.m.**

- Instruction :**
- 1) All questions are compulsory.**
  - 2) Figures to the right indicate full marks.**
  - 3) Draw neat diagrams and give equations wherever necessary.**
  - 4) Chemical equations are to be written wherever necessary.**

**Q.1) A. Write the answers of following in one sentence. [4]**

- Define functional groups.
- In which reaction is phosphorus ylide used as a reagent?
- What is homolytic fission?
- Give the long form of DCC.

**Q.1) A) Choose the correct alternative for the following questions. [4]**

- Detection of N-methyl group of alkaloid is done by .....
  - Bromination
  - Herzig-Meyer method
  - Wilkinson method
  - Ziesel method
- Addition of water across a double bond is called as .....
  - hydroxylation
  - hydrogenation
  - hydration
  - oxidation

- iii) The best method to synthesize aromatic ketone is .....
- a) Reformatsky reaction      b) Friedel Crafts alkylation  
c) Friedel Crafts acylation      d) Diel-Alder reaction
- iv) Reducing agent amongst the following is .....
- a)  $SeO_2$       b) Raney nickel  
c) DCC      d)  $OsO_4$

**Q.2) Attempt any two of the following :** [12]

- a) How will you establish the structure of Nicotine on the basis of analytical evidence?
- b) What are drugs? Give the synthesis of the following drugs.
- i) Ethambutol  
ii) Benzocaine
- c) i) Give the method of preparation of  $OsO_4$  and its two applications.  
ii) Write notes on Markovnikov addition.

**Q.3) Attempt any three of the following :** [20]

- a) Give the synthesis of Citral.
- b) Explain nucleophiles and electrophiles with suitable examples.
- c) Give the mechanism of Hofmann bromamide reaction.
- d) Describe the Hydroxylation reaction in alkene.
- e) Define the following terms :
- i) Target molecule  
ii) Disconnection  
iii) Synthone  
iv) Synthetic equivalent

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**B.Sc. (Part - III) (Semester - VI) (CBCS)****Examination, March - 2024****CHEMISTRY (Paper - XV)****Physical Chemistry****Sub. Code : 81676****Day and Date : Thursday, 28-03-2024****Total Marks : 40****Time : 02.30 p.m. to 04.30 p.m.**

- Instruction :**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Use of scientific calculator, logarithmic table are allowed.

**Q.1) A) Answers the following questions in one sentence. [4]**

- i) Write Gibb's phase rule for three component system.
- ii) Write an expression for Gibb's Helmholtz equation.
- iii) State distribution law.
- iv) Give example of parallel reaction.

**B) Choose the correct alternative for the following questions. [4]**

- i) (111) plane of a crystal is called as ..... plane.
  - a) cubic
  - b) diagonal
  - c) cube diagonal
  - d) face
- ii) Which of the following is the correct expression for Bragg's law?
  - a)  $n\lambda = 2d \sin \theta$
  - b)  $2n\lambda = d \sin \theta$
  - c)  $2\lambda = nd \sin \theta$
  - d)  $d\lambda = 2 n \sin \theta$



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**B.Sc. (Part - III) (Semester- VI) (CBCS)****Examination, March 2024****CHEMISTRY Paper - XVI****Industrial Chemistry****Sub. Code : 81677****Day and Date : Saturday, 30/03/2024****Total Marks : 40****Time : 2.30 p.m. to 4.30 p.m.**

- Instructions :**
- 1) All questions are compulsory.
  - 2) Figures to the right indicate full marks.
  - 3) Draw neat and labelled diagram wherever necessary.

**Q. 1A) Answer the following in one sentence. [04]**

- 1) Write the name of process used for removing impurities from cane juice.
- 2) Which strong smelling chemical is used to detect leakage of LPG.
- 3) Which monomer is used for manufacturing of PVC?
- 4) The diesel fuel is rated using which number?

**B) Select the most correct alternative among those given below and rewrite the sentence again. [04]**

- 1) One nanometer is .....meter.
  - a)  $10^{-9}$
  - b)  $10^{-8}$
  - c)  $10^{-7}$
  - d)  $10^{-6}$
- 2) Solution of gold nanoparticles shows different colours due to
  - a) different concentration
  - b) different particle size
  - c) different energy
  - d) All of the above
- 3) Free radical binds to monomer to form....
  - a) larger cation
  - b) larger anion
  - c) larger free radical
  - d) small cation

- 4) Petroleum resources are highest in....
- a) India
  - b) Venezuela
  - c) United Arab Emirates
  - d) Iraq

**Q. 2) Attempt any Two of the following [20]**

- 1) Discuss the manufacturing plant and process of ammonia by Haber process.
- 2) Discuss the concentration of juice to syrup in multiple effect evaporator.
- 3) Define polymerization. Discuss ionic addition polymerization.

**Q. 3) Attempt any Three of the following. [12]**

- 1) Draw the neat labelled diagram of plant used for manufacture of sulphuric acid by contact process?
  - 2) Explain in brief cracking in petroleum Industry.
  - 3) What is octane number explain in brief.
  - 4) Write note on applications of nanomaterials.
  - 5) Explain Hydrothermal method used to prepare nanomaterials.
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**B.Sc. (Part - III) (Semester - VI) (CBCS)**

**Examination, April 2024**

**ENGLISH (Compulsory) (Paper - IV)**

**Ability Enhancement Compulsory Course**

**English for Communication**

**Sub. Code : 81667**

**Day and Date : Monday, 01/04/2024**

**Total Marks : 40**

**Time : 2.30 p.m. to 4.30 p.m.**

**Instructions : 1) All questions are compulsory.**

**2) Figures to the right indicate full marks.**

**Q.1 A) Rewrite the following choosing the correct alternative:**

**[3]**

1. Buffalo Bill stays open .....a day, .....a week.
  - a. 12 hours, 3 days
  - b. 6 hours, 2 days
  - c. 24 hours, 7 days
  - d. 20 hours, 5 days
2. Granny's piercing eyes could detect.....
  - a. any disease
  - b. uneasiness
  - c. deep buried pain
  - d. unhappiness
3. The grass lifts its head into flat ..... by the frenzied machine.
  - a. tree
  - b. velvet
  - c. women
  - d. grass

**B. Answer the following questions in one word/ phrase /sentence each. [3]**

1. Who is regarded as the Booker T. Washington of Maharashtra?
2. What is Lachmi doing while chatting?
3. Who cures Govind Singh of his madness?

**Q.2)A) Answer any two of the following questions in 3 to 4 sentences each. [4]**

1. What does the word 'pawn' mean? Which meaning fits this poem?
2. How was the absence of Granny felt by the poetess?
3. What does the grass do?

**B) Write a short note on any one of the following in about 7 to 8 sentences.[4]**

1. Anna's education mission
2. Lachmi

**C) Do as directed [2]**

Write antonym of the following word.

'Aggressive'

Write synonym of the following word.

'Dirty'

**Q.3.A) Build up a short piece of group discussion on the following topics making use of expressions and interactions used in group discussion. [8]**

Save Environment means Save the Earth.

**OR**

Terrorism is serious problem in our country.

**B) You are planning a family trip to your favourite place. Make notes of what you must do to get most out of this trip. Use the 'mind mapping' technique for this purpose. [8]**

**Q.4. Write a summing up or a part of a talk/discussion/Interview/Musical programme on television. [8]**

**OR**

**You happen to be the editor of an English newspaper published from Maharashtra. You are expected to write an editorial on death of a famous film personality.**