Seat	
No.	

B.Sc. (Part-III) Semester-VI Examination, March 2024.

	INORGANIC CHEWIISTRY (Paper-XIII)							
				Suk	b. Code : 81	674	4	
_	Day and Date: Tuesday, 26-03-2024 Time: 02.30 p.m. to 04.30 p.m.							
Inst	ructi	ions:	1)	-	s are compulse	٠		
			2)		e right indica			
			3)	Draw neat ar	nd labelled di	agr	ams wherever necessary.	
Q.1	a)	Ansv	wer the	following in on	ne sentence.			(4)
	1)	Give	any two	o control rods us	sed in heavy wa	ater	nuclear reactors.	
	2)	Wha	t is lantl	nanide contraction	on?			
	3)	Whic	ch metal	l is involved in b	blood clotting?			
	4)	Defi	ne calcir	nation.				
	b)	Cho	ose the	correct alternat	tive and rewr	ite 1	the sentence.	(4)
	1)	In di	ssociativ	ve mechanism, b	ond		is predominant.	
		(A)	breakii	ng	(I	B)	partial breaking	
		(C)	not bre	eaking	(1	D)	making	
	2)	Usua	ılly Na ⁺	is extracellular	while		is intracellular in biological proce	ess.
		(A)	Mg^{++}		(1	B)	K ⁺	
		(C)	Ca ⁺⁺		(1	D)	Na ⁺⁺	
	3)	Artif	icial tra	nsmutation was	first reported b	эу		
		(A)	Chadw	rick	(I	B)	Rutherford and Chadwick	
		(C)	Blacke	ett	(1)	D)	Rutherford	

1 P.T.O.

	4)	For dating of historic and archaeological organic samples, isotope is used.						
		(A) Cl-36 (B) Cr-51						
		(C) C-14 (D) Na-23						
Q.2	Atte	npt ANY TWO of the following. (20)						
	1)	Describe ion exchange method for separation of lanthanide and give its advantages.						
	2)	Explain SN ¹ mechanism with energy profile diagram and example.						
	3)	Explain chemical reactions involved in different zones of blast furnace and give the byproduct of blast furnace.						
Q.3	Atte	npt ANY THREE of the following. (12)						
	1)	Write short note on 'Thermodynamic stability of complex'.						
	2)	Give a general account of use of U and Th in atomic energy.						
	3)	Role of Na ⁺ and K ⁺ in biological process.						
	4)	Mention methods for the synthesis of transuranic elements. Explain in brief Heavy ion bombardment method with one example.						
	5)	Describe acid hydrolysis for Co (III) octahedral complexes.						

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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]

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

Q.1) A) Choose the correct alternative for the following questions.

[4]

- i) Detection of N-methyl group of alkaloid is done by
 - a) Bromination
- b) Herzig-Meyer method
- c) Wilkinson method
- d) Ziesel method
- ii) Addition of water across a double bond is called as
 - a) hydroxylation
- b) hydrogenation

c) hydration

d) oxidation

-1- P.T.O.

		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)	Redu	acing agent amongst the following	llowin	g is
			a)	SeO_2	b)	Raney nickel
			c)	DCC	d)	OsO_4
Q.2)	Atte	mpt a	ny tv	wo of the following:		[12]
ŧ	a)		will ence?	•	of Nic	cotine on the basis of analytical
ł	b)	Wha	t are	drugs? Give the synthesis o	f the	following drugs.
		i)	Etha	mbutol	X	
		ii)	Benz	zocaine)	
(c)	i)	Give	the method of preparation	of Os	cO_4 and its two applications.
		ii)	Writ	e notes on Markovnikov ad	ldition	1.
Q.3)	Atte	mpt a	ny tl	rree of the following:		[20]
ä	a)	Give	the s	ynthesis of Citral.		
1	b)	Expl	ain nı	ucleophiles and electrophile	es witl	h suitable examples.
(c)	Give the mechanism of Hofmann bromamide reaction.				de reaction.
(d)	Describe the Hydroxylation reaction in alkene.				ene.
•	e)	Defi	Define the following terms :			
		i)	Target molecule			
		ii)	Disc	onnection		
		iii)	Synt	hone		
		iv)	Synt	hetic 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]

[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.

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) $2\lambda = \text{nd sin } \theta$
- d) $d\lambda = 2 n \sin \theta$

-1- P.T.O.

	i	ii) T	The o	distribution of solute between	een tw	o immiscible solvents is called
		•	•••••	of a substance.		
		á	a)	partition	b)	solvation
	•		c)	both a) and b) options	d)	none of these
	i	(v)	Unit	cell of NaCl contains	Na ⁺	ions and Cl^- ions.
		í	a)	14, 13	b)	12, 13
		(c)	13, 12	d)	11, 14
Q.2) A	Attem	npt aı	ny tv	vo of the following:		[20]
i)) I	Deriv	e Vai	n't Hoff equation.	•	
ii	i) V	What is diffraction of X-ray? Derive Bragg's equation.				
ii	ii) I	Discu	ss th	e application of phase rule	to KI	-water system.
Q.3) A	Attem	ıpt aı	ny th	aree of the following:		[12]
i)) \	Write	a sh	ort note on 'Distribution la	w'.	
ii	i) S	State (Gibb	's phase rule. Give its equ	ation.	
ii	ii) V	Write	a sh	ort note on 'Partial Molar'	Volum	e'.
iv		-	_	_	•	ographic axes at the multiples of the Miller indices of the plane?
v	') \	Write	a sh	ort note on 'Opposing reac	etions'	

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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 ismeter.
 - 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) (Semenster - VI) (CBCS) **Examination, April 2024 ENGLISH (Compulsory) (Paper - IV)**

Ability Enhancement Compulsory Course

		English for Co	mmı	ınication	
		Sub. Code	e : 81	1667	
Day and D	ate:	Monday, 01/04/2024		Total Marks: 40	
Time: 2.30	0 p. m	. to 4.30 p.m.			
Instruction	ns:	1) All questions are comp	ulsoi	·y.	
		2) Figures to the right in	dicate	e full marks.	
Q.1 A) Re	ewrite	e the following choosing the	corre	ect alternative:	[3]
1.	Buffa	alo Bill stays opena day	,	a week.	
	a.	12 hours, 3 days	b.	6 hours, 2 days	
	c.	24 hours, 7 days	d.	20 hours, 5 days	
2	Gran	ny's niaraina ayas aguld dataat			

- Granny's piercing eyes could detect.....
 - any disease a.

- b. uneasiness
- deep buried pain c.
- d. unhappiness
- 3. The grass lifts its head into flat by the frenzied machine.
 - a. tree

b. velvet

c. women

- d. grass
- Answer the following questions in one word/ phrase /sentence each. [3] В.

1

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

P.T.O.

Q. 2)A) A	nswer 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]
Writ	te antonym of the following word.
	'Aggressive'
Writ	te synonym of the following word.
Q.3.A)	'Dirty' 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) Q.4.	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] 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.