#### Rayat Shikshan Santha, Satara Second Semester Examination 2023 -24 Std - XI Marks - 70 Time - 3.00 Hrs. Sub - Chemistry Pages - 4

## **General Instructions-**

The question paper is divided into four section.

- 1) Section A Q. No 1 contains Ten multiple choice type of questions. carrying one mark each. Q. No 2 contains Eight short answer type of questions carrying one mark each.
- 2) Section B Q. No 3 to Q. No 14 are Twelve short answer type (I) of questions carrying two marks each. ( Attempt any Eight )
- 3) Section C Q. No 15 to Q. No 26 are Twelve short answer type (II) of questions carrying Three marks each. (Attempt any Eight)
- 4) Section D Q. No 27 to Q. No 31 are Five long answer type of questions carrying four marks each. (Attempt any Three)
- 5) Use of log table is allowed. Use of calculator is not allowed.
- 6) Figures to the right indicate full marks.
- 7) For each multiple choice type of questions, it is manditory to write the correct answer along with its alphabet. eg. a)..../ b)..../ c)..../ d).... No marks (s) shall be given, It only the correct answer or the alphabet of the correct answer is written Only the first attempt will be considered for evaluation.
- 8) Physical constant : Avogadro's N = 14, O = 16, S = 32, Fe = 26,  $CI = 8.314 \, Jk - 1 \, mol^{-1}$ . V = 23, Sb = 51,

### Section - A

#### Select and write the correct answer for the following multiple 1. choice type of questions :.

- 1) Phenol  $\xrightarrow{A}$  Benzene. In this reaction the reagent 'A' is ...... c) Zn d) K þ) Ca a) Na
- 2) Oxidation of sulfur dioxide to sulfur trioxide with dioxygen (O<sub>3</sub>) in the presence of nitric oxide in gaseous phase act as .....
  - a) inhibitor b) homogeneous
  - d) enzyme catalyst c) heterogeneous catalyst
- 3) Which of the following species will have the largest size Mg, Mg<sup>2+</sup> , Fe, Fe<sup>3+</sup> ? d) Fe<sup>3+</sup> c) Mg<sup>2+</sup>

-a) Fe b) Ma

18

10

4) A solution is prepared by adding 2 gm of substance A to 18 g of water, the mass percent of solute is ..... d) 10.00 w/w

c) ⊥.0 w/w a) 0.⊥w/w b) 0.01 w/w

Std -	11 ~		4.5	1 18 M	(2)		Sub - Chemi	stry	
	5)	Whi	ch of the f	ollowing ele	ctrolyte	s is used to n	naintain electrical		
لمحرر		neu	trality in th	e Daniel cel	?				
		a)	KCI	b) KOH		c) NH₄Cl	-d) NaCl		
	6)	Imp	oure comm	ion salt can	be pu	rified by			
		a)	distillation	∕b) crysta	llization	c) extractio	n d) sublimation		
	7)	The	equilibriu	m, H <sub>2</sub> O <sub>(1)</sub>	<del>,</del> → H <sup>⊕</sup>	<sub>aq)</sub> + OH <sup>e</sup> <sub>(aq)</sub> is	5		
		a)	Static	لم (Physic	cal _	dynamic (ع	d) mechanical		
	8)	The	e missing p	particle from	the nu	uclear reactio	n is		
	/	AI -	+ He $\longrightarrow$	? +					
	-	(ھر	15 <sup>P</sup>	b) <sup>32</sup> S		c) <sup>14</sup> <sub>10</sub> Ne	d) ,₄Si		
	9)	The	e correct s	tatement re	garding	electrophile	is		
4		a)	Electroph	ile is a <mark>ne</mark> ga	tively c	harged specie	es and can form a		
			bond by a	accepting a	pair of	electrons from	a nucleophile.		
		b)	Electroph	ile is a nega	tively c	harged specie	es and can form a		
			bond by a	accepting a	pair of	electrons from	another electrophile	2	
		C)	Electroph	il <b>es a</b> re <b>gen</b>	erally n	eutral species	and can form a bon	d.	
			by accept	ting a pair o	f electro	ons from a nu	cleophile.	-	
		d)	Electroph	ile can <b>be ei</b>	ther ne	utral or positiv	vely charged species		
			and can	form a bond	by acc	epting a pair	of electrons from a		
			nucleoph	ile.			_		
	1	0)	Which of	the followin	ig is use	ed as a weak	antiseptic for eyes ?		
			a) Tinctu	re of iodine	b	) Dilute soluti	on of dettol		
			_c) Iodofa	orm 👘	c	l) Dilute aqueo	us solution of boric aci	d.	
2.	Ans	ver	the follow	ving q <b>uest</b> i	ions.			8	
1	1	.) W	hat are de	aning agent	s?				
	2	2) St	ate Avoga	dro's law					
2.3	3	3) W	rite the for	rmula to cal	culate b	ond order of	molecule.		
	2	4) W	hat are all	ali metals ?					
		5) D	efine - sur	face tension					
	6) Write IUPAC name of following.								
	Ť,	,	, ŭ						
	2		$\sim$	$\sim$					
	1	7) (	live name o	of molecule	having	banana bond			
	1	<b>o</b> ) [	<sup>vefine</sup> - Wa	velength ()	)				
			*	S	ection	- B		16	
_	AU	min	<sup>c any</sup> Eigi	nt of the fo	llowin	-			
3.	Dra	W ne	at, labelled	diagram	-iowin	y.			

Draw neat, labelled diagram of Daniel cell.

Std - 11th

(3)

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- 4. How many sign ificant figures are in each of the following quantities ?
  a) 0.00020 kg
  b) 8.50 x 10<sup>4</sup> mm
- 5. Explain in detail the steps involved in hybridization.
- 6. Explain the structure of Borontrichloride (BCl<sub>3</sub>)
- Write the characteristics of equilibrium constant.
- 8. Write oxidation state and outer electronic\_configuration of Group 14.
- 9. Define a) Metamerism b) Carbocation.
- 10. What is the action of following on benzenea) Ozoneb) Chlorine in presence of U. V. light ?
- 11. What are antimicrobial drugs ? Write molecular formula of butylated hydroxy toluene.
- 12. Read the following reaction and answer the questions given below.

$$CH_3 - C = CH_2 + HBr \xrightarrow[]{\text{Benzoyl}}_{\text{Peroxide}} H_3C - C - CH_2 - Br$$

- a) Write IUPAC name of the product 1 Brome methy poppan
- b) State the rule that governs formation of this product. The
- 13. Define a) Electron gain enthalpy b) Shielding effect
- 14. Name the different types of chromatographic techniques and explain the principle underlying them

# Section - C

# Attempt Any Eight of the following.

- 15. Predict the block, periods and groups to which the following elements belong.
  a) V (Z = 23)
  b) Sb (Z = 51)
- 16. State Le-Chatelier's principle. Draw structures representing staggered and eclipsed conformations of ethane using.
  - a) Sawhorse projection b) Newman projection
- 17. Why is O<sub>2</sub> molecule paramagnetic ? What is the action of following on dihydrogen ?
  a) Dioxygen
  b) Sodium metal
- 18. Calculate the oxidation number of P in  $Ca_3 (PO_4)_2$ Define - graphene. Write allotropes of phosphorus.
- 19. The half life of Radon is 3.82 d. By what time would 99.9% of Radon will be decayed.
- 20. Mention factors affecting adsorption of gas on solids. State Hunds rule of maximum multiplicity.
- 21. What is adsorption isotherm ? Write condensed orbital notation electronic configuration of the following elements.

a) Chlorine (Z = 17) b) Zinc (Z = 30)

Sub -	Chem	istry
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SI	d - 1	Sub - Chemis	try							
22.	A	Compound with molar mass 159 was found to contain 39.62% copper								
	an	d 20.13% sulphur. Suggest molecular formula for the compound								
,	(Al	tomic masses : $Cu = 63$ , $S = 32$ and $O = 16$ .)								
23.	Ex	plain homolytic cleavage and heterolytic cleavage.								
	De	fine - Isoelectronic sp <b>ecies</b> .								
24.	Ca	Iculate the volume of one mole of gas at exactly 20 °C at a pressure of								
	10	1.35 KPa. Write SI unit of viscosity coefficient.								
25.	Wr	ite the type of hybridization and geometry of NH <sub>3</sub> molecule.								
	Inc	dicate the number of unpaired electrons in	32							
	a)	Nickel (Z = 28) b) Chromium (Z = 24)								
<b>2</b> 6.	Sta	ate and explain Boyle's law. What is the SI unit of Rate of diffusion ?								
2		Section - D	12							
	At	tempt Any Three of the following.								
27.	a)	Calculate the number of atoms in 42 g of nitrogen (N)	2							
	b)	What are alkynes ? Write chemical equation for combustion of butane.	2							
28.	a)	How will you prepare ethane from	2							
		i) ethyl bromide ii) ethyl magnesium bromide	-							
2	b)	Define - Atomic mass unit (a. m. u.)	2							
	c)	Calculate molecular mass of ethyl alcohol.	-							
29.	a)	Draw Lewis dot structure of i) $CF_3CI$ ii) $C_2H_6$	2							
	b)	Derive the expression of equilibrium constant, Kc for the reaction.	2							
-		$A + B \rightleftharpoons C + D$	2							
<b>3</b> 0.	a)	Distinguish between sigma ( $\sigma$ ) and PI ( $\pi$ ) bond.	2							
	b)	Calculate unit of equilibrium constant for the following equilibrium								
		reaction.								
		$H_{z_{(q)}} + I_{z_{(q)}} 2HI_{(q)}$	_							
31.	a)	State the importance of sodium and potassium in biological system.	2							
	b)	Write any two uses of $H_2O_2$ .	1							
	C)	Write molecular formula and structure of orthophosphoric acid.	1							
		₹n.								