CLASS : 12th (Sr. Secondary) **3679/3629**

Series : SS-M/2018

Total No. of Printed Pages : **15**

SET : A, B, C & D

MARKING INSTRUCTIONS AND MODEL ANSWERS

CHEMISTRY

ACADEMIC/OPEN

(Only for Fresh/Re-appear Candidates)

उप-परीक्षक मूल्यांकन निर्देशों का ध्यानपूर्वक अवलोकन करके उत्तर-पुस्तिकाओं का मूल्यांकन करें। यदि परीक्षार्थी ने प्रश्न पूर्ण व सही हल किया है तो उसके पूर्ण अंक दें।

General Instructions :

(i) Examiners are advised to go through the general as well as specific instructions before taking up evaluation of the answer-books.

(ii) Instructions given in the marking scheme are to be followed strictly so that there may be uniformity in evaluation.

(iii) Mistakes in the answers are to be underlined or encircled.

(iv) Examiners need not hesitate in awarding full marks to the examinee if the answer/s is/are absolutely correct.

(v) Examiners are requested to ensure that every answer is seriously and honestly gone through before it is awarded mark/s. It will ensure the authenticity as their evaluation and also enhance the reputation of the Institution.

(vi) A question having parts is to be evaluated and awarded partwise.

(vii) If an examinee writes an acceptable answer which is not given in the marking scheme, he or she may be awarded marks only after consultation with the head-examiner.

(viii) If an examinee attempts an extra question, that answer deserving higher award should be retained and the other scored out.

(ix) Word limit wherever prescribed, if violated upto 10%. On both sides, may be ignored. If the violation exceeds 10%, 1 mark may be deducted.

(x) Head-examiners will approve the standard of marking of the examiners under them only after ensuring the non-violation of the instructions given in the marking scheme.

(xi) Head-examiners and examiners are once again requested and advised to ensure the authenticity of their evaluation by going through the answers seriously, sincerely and honestly. The advice, if not headed to, will bring a bad name to them and the Institution.

महत्वपूर्ण निर्देश :

(i) अंक-योजना का उद्देश्य मूल्यांकन को अधिकाधिक वस्तुनिष्ठ बनाना है। अंक-योजना में दिए गए उत्तर-बिन्दु अंतिम नहीं हैं। ये सुझावात्मक एवं सांकेतिक हैं। यदि परीक्षार्थी ने इनसे भिन्न, किन्तु उपयुक्त उत्तर दिए हैं, तो उसे उपयुक्त अंक दिए जाए।

(ii) शुद्ध, सार्थक एवं सटीक उत्तरों को यथायोग्य अधिमान दिए जाए।

(iii) परीक्षार्थी द्वारा अपेक्षा के अनुरूप सही उत्तर लिखने पर उसे पूर्णांक दिए जाए।

(iv) वर्तनीगत अशुद्धियों एवं विषयांतर की स्थिति में अधिक अंक देकर प्रोत्साहित न करें।

(v) भाषा-क्षमता एवं अभिव्यक्ति-कौशल पर ध्यान दिया जाए।

(vi) मुख्य-परीक्षकों/उप-परीक्षकों को उत्तर-पुस्तिकाओं का मूल्यांकन करने के लिए केवल Marking Instructions/Guidelines दी जा रही है, यदि मूल्यांकन निर्देश में किसी प्रकार की त्रुटि हो, प्रश्न का उत्तर स्पष्ट न हो, मूल्यांकन निर्देश में दिए गए उत्तर से अलग कोई और भी उत्तर सही हो तो परीक्षक, मुख्य-परीक्षक से विचार-विमर्श करके उस प्रश्न का मूल्यांकन अपने विवेक अनुसार करें।

SET – A

1. (i) (D) 1

(ii) 2-Methyl cyclohexonone 1

(iii) Triammine bromidochlorido iodidochromium (iii) 1

(iv) (C) 1

(v) (B) 1

(vi) (B) 1

(vii) (A) 1

(viii) (D) 1

(ix) (D) 1

(x) (B) 1

(xi) (C) 1

(xii) (A) 1

2. Correct difference between two polymers. 2

3. Any ***two*** uses of Henry's Law 2

4. In this equal no. of cations and Anions are missing from their crystal letters No effect on density. Eg. Nacl or any other Eg. 2

5. Formulae $\frac{1}{2}$

$$M = \frac{W}{Mm} \times \frac{1000}{\text{Volume of solution}}$$

$$M = \frac{4}{40} \times \frac{1000}{500} = 0.2M$$

Answer = 0.2M $1\frac{1}{2}$

6. Given $M = .05, \quad R = 31.6\Omega$

Cell constant = $.357\,cm^{-1}$

Conductivity = $\frac{1}{R} \times$ cell constant

$= \frac{1}{31.6} \times .357 = .0113\Omega^{-1}cm^{-1}$ 1

Molar conductivity = $\frac{K \times 1000}{M}$

$= \frac{0.0113 \times 1000}{.05} = 226\Omega^{-1}cm^2mol^{-1}$ 1

7. Definition 1

Example 1

8. Complete explanation 2

9. Definition 1

Example 1

10. For each part 1 mark × 2 2

11. Principle for this process 1

Explanations 2

12. For each part $1 \times 3 = 3$

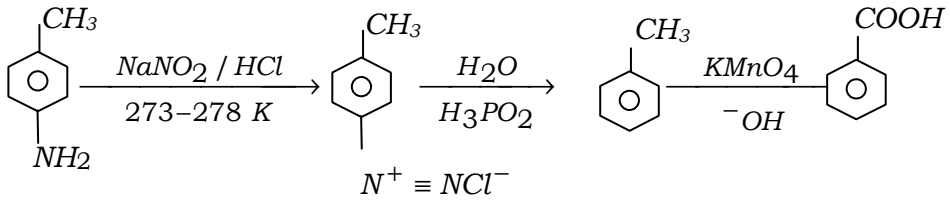
(Any correct reaction can be given for these)

13. Correct explanation with one example for each type of catalysis.
Explanation 2

Example for each $\frac{1}{2} \times 2 = 1$

14. For each correct definition $1 \times 3 = 3$

15.



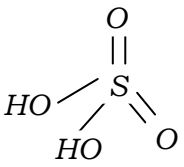
16. For contecl process steps are :

(i) Burning of S to produce SO_2 1

(ii) Conversion of $SO_2 \xrightarrow{V_2O_5} SO_3$ 1

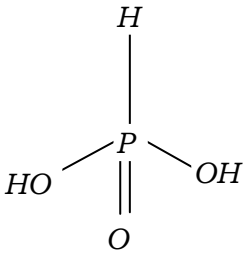
(iii) Absorption of SO_3 in H_2SO_4 to gives $H_2S_2O_7$ 1

(iv) Suitable condition to get max. yield $2SO_2 + O_2 \xleftrightarrow{V_2O_5} 2SO_3 + 196.6 \text{ kgm}$ 1

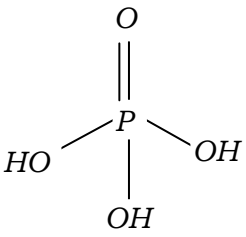
Structure  1

OR

For each structure $1 \times 2 = 2$

(a) 

H_3PO_4



H_3PO_4

(b) Any three properties of nitrogen which are different from other members of its family. 3

17. For each part $2\frac{1}{2} \times 2 = 5$

For Part (I) Explanation showing variable oxidation states i. e. Zero to +8 with suitable example and giving reasons for their variable oxidation states.
Part (II) Explanation including few examples of reactions in which transition metals as catalyst and giving reason why they act as catalyst.

OR

(a) (i) $2MnO_4^- + 5s^{2-} + 16H^+ \rightarrow 2Mn^{2+} + 8H_2O + 5s$ 1

(ii) $2MnO_4^- + 10I^- + 16H^+ \rightarrow 2Mn^{2+} + 8H_2O + 5I_2$ 1

(iii) $MnO_4^- + 5Fe^{2+} + 8H^+$ 1

$Mn^{2+} + 5Fe^{3+} + Mn^{2+}$ ←

(b) Correct answer will reason. 2

18. (a) Any chemical test can be given to distinguish between Phenol and Benzoic acid.

(b) For each conversion using any method for conversion. $1 \times 3 = 3$

OR

Correct explanation with correct reactions of Hell-Volhard zelinsky reaction and Aldol condensation

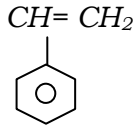
For each part $2\frac{1}{2} \times 2 = 5$

SET – B

1.	(i) (D)	1
	(ii) (A)	1
	(iii) (C)	1
	(iv) (A)	1
	(v) (B)	1
	(vi) (C)	1
	(vii) N-Ethyl - N- methyl ethanamine	1
	(viii) (A)	1
	(ix) $C_6H_5NH_2 < C_6H_5CH_2NH_2 < C_2H_5NH_2 < (C_2H_5)_2NH$ Inc. order of basicity.	1
	(x) (B)	1
	(xi) (A)	1
	(xii) (C)	1
2.	Definition	1
	Any example	1
3.	***Two*** applications of samiconductors	2
4.	Part A	1
	Part B	1
5.	Definition for diamagnetic substances	1
	Feromagnetic substances	1
6.	Definition	1
	Two methods	$\frac{1}{2} + \frac{1}{2} = 1$

7. 1, 3- Butadiene and Acrylonitrile 2

1, 3- Butadiene and Styrene



8. Correct reason of acidity. 2

9. For formula $\frac{1}{2}$

$$M = \frac{W}{M_n} \times \frac{1000}{V} \text{ of solution in ml.}$$

molar mass of KOH = $39 + 16 + 1 = 56$

$$M = \frac{5.6}{56} \times \frac{1000}{500} = 0.2 \text{ m}$$

Answer = 0.2 m $1\frac{1}{2}$

10. Conversion by any method

Part (i) 1

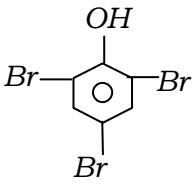
Part (ii) 1

11. (i) Pentaammine bromido cobalt (iii) sulphate 1

(ii) Potassium hexacyanido ferrate (iii) 1

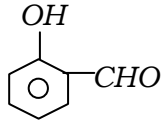
12. Complete explanation of the process. 3

13. (i)



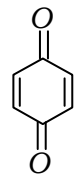
1

(ii)



1

(iii)



1

14. For each part $1 \times 3 = 3$

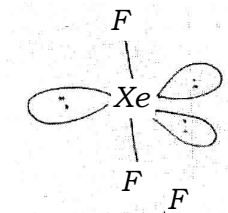
15. Explanation with diagram 3

16. Part (i) Correct explanation with example $2\frac{1}{2}$

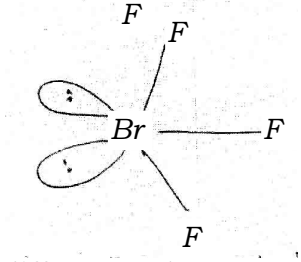
(ii) Correct explanation with example $2\frac{1}{2}$

OR

Marks as indicated in question paper. [Conversion can be done by using any method] 2

17. (a) (i) 

1

(ii) 

1

(b) ***Two*** differences between white phosphorus and Red phosphorus. 2

(c) $H_2o < H_2S < H_2Se < H_2Te$ 1

OR

Part (i) Correct reason 2

Part (ii) Correct reason 2

Part (iii) $PH_3 < AsH_3 < NH_3 < BiH_3$ 1

Increasing order of boiling point. 1

18. Preparation of $KMnO_4 \Rightarrow$ 2

Rxs. of $KMnO_4 \Rightarrow$

(i) $2MnO_4^- + 5SO_2 + 2H_2O \rightarrow 2Mn^{2+} + 4H^+ + 5SO_4^{2-}$ 2

(ii) $5C_2O_4^{2-} + 2Mn0_4^- + 16H^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$ 1

(iii) $5Fe^{2+} + MnO_4^- + 8H^+ \rightarrow Mn^{2+} + 4H_2O + 5Fe^{3+}$ 1

OR

(a) (i) $Fe^{2+} =_{18} [Ar]3d^6$ 1

(ii) $Cr =_{18} [Ar]4s^1 3d^5$ 1

(iii) $Mn =_{18} [Ar]\, 3d^5$ 1

(b) Correct reason 2

SET – C

1. (i) (C) 1

(ii) (A) 1

(iii) (B) 1

(iv) (D) 1

(v) (D) 1

(vi) (A) 1

(vii) (A) 1

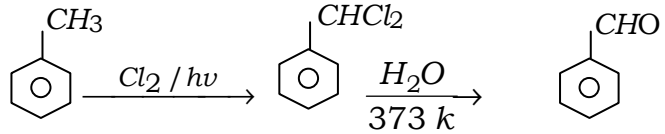
(viii) (A) 1

(ix) $C_4H_{10} < C_2H_5OC_2H_5 < C_3H_7CHo < C_4H_9OH$ 1
Increasing order of boiling points

(x) (B) 1

(xi) 1-chloro-2-phenylethane 1

(xii) (B)

2. 

2

3. For any ***two*** differences $1 \times 2 = 2$

4. $\lambda m = \frac{K \times 1000}{M}$ $\frac{1}{2}$

For answer $= \frac{.0248 \times 1000}{.20}$

$= 1245 \text{ ohm}^{-1}\text{cm}^2\text{mol}^{-1}$ $1\frac{1}{2}$

5. For correct explain with any examples. 2

6. Molar mass of $CH_3OH = 32g$

$H_2O = 18g.$

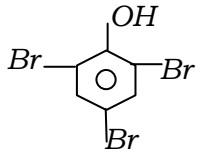
Amount $H_2O = 100 - 30 = 70g$

No of moles of $CH_3OH = \frac{30}{32} = .937$

$H_2O = \frac{70}{18} = 3.88$ 1

Mole fraction of $CH_3OH = \frac{.937}{.937 + 3.88}$

= 0.194 1

7. (a)  1

(b)  1

8. For each 1 mark × 2 2

9. For definition 1

For example 1

10. For each difference $1 \times 2 = 2$

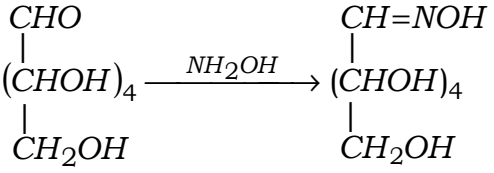
11. For each correct answer $1 \times 3 = 3$

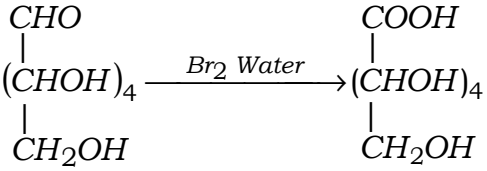
12. Definition 1

Two examples 2

13. (a) $\begin{matrix} CHO \\ | \\ (CHOH)_4 \\ | \\ CH_2OH \end{matrix} \xrightarrow[\Delta]{HI} CH_3(CH_2)_4CH_3$ 1

n-Hexone

(b)  1

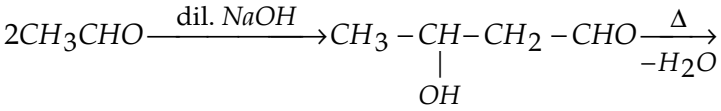
(c)  1

14. For part a , correct example. $1\frac{1}{2}$

For part b , correct example. $1\frac{1}{2}$

15. Complete explanation with reactions and basic principle is the metal is heated in an evacuated vessel with iodine. Gives $Z_r + 2I_2 \rightarrow ZrI_4$ which is decomposed at 1800k to get pure metal $ZrI4 \xrightarrow{1800\ K} Zr + 2I_2$ 3

(Only structures/formulae of products)

16. (a) 

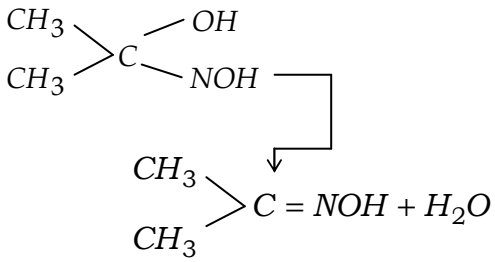
(b) Cannizzaro's Reaction : Aldohydes without α-hydrogen atom can undergo self oxidation or reduction in presence of strong alkali solution.

$$HCHO + HCHO \xrightarrow[KOH]{cons.} CH_3OH + HCOOK$$

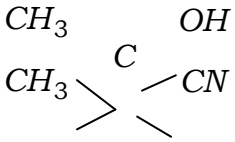
(Any other example of this reaction can be given).

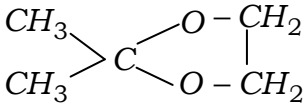
OR

(a) Correct answer + correct reason. 1+ 1 = 2

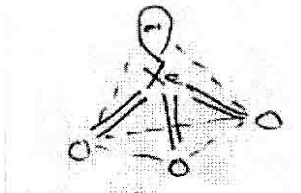
(b) (i)  1

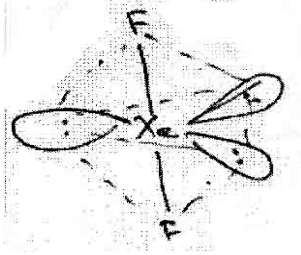
1

(ii)  1

(iii)  1

17. (a) For each use of Noble gases $1 \times 3 = 3$

(b) X_eO_3 structure  1

X_eF_2 structure  1

OR

(a) Definition, types (with example atlest for two types of interhologens). 1 + 2 = 3

(b) Correct reason for reactivity of inter hologens. 2

18. Definition of Lanthanide contraction. 1

Reason of Lanthanide constriction 1

Any ***three*** consequences 3

OR

(a) (i) $Cr_2O_7^{2-} + 14H^+ + 6Fe^{2+} \rightarrow 2cr^{3+} + 6Fe^{3+} + 7H_2O$ 1

(ii) $Cr_2O_7^{2-} + 6I^- + 14H^+ \rightarrow 2cr^{+3} + 7H_2O + 3I_2$ 1

(iii) $MnO_4^- + 5Fe^{2+} + 8H^+ \rightarrow Mn^{2+1} + 5Fe^{3+1} + 4H_2O$ 1

(b) Correct explanation. 2

SET – D

1. (i) (C) 1

(ii) (C) 1

(iii) (D) 1

(iv) (B) 1

(v) (A) 1

(vi) (D) 1

(vii) 4-chlorobenzene sulphonic acid 1

(viii) (B) 1

(ix) (A) 1

(x) $2C_2H_5I + H_20$ 1

(xi) $C_2H_5OH < CH_3OH <$ Phenol < p – Nitro – phenol 1

(xii) (C) 1

2. Definition 1

For each example (Any) $\frac{1}{2} \times 2 = 1$

3. Correct answer $\frac{1}{2} \times 2 = 1$

At corners $X = 8 \times \frac{1}{8} = 1$ 2

At corners $Y = 6 \times \frac{1}{2} = 3$ 1

XY_3 1

4. Definition 1

Classification 1

5. For each correct definition $1 \times 2 = 2$

6. Definition with role of Activation Energy. 2

7. Hexamethylene diammine 2

8. Conversion of energy of fuels like H_2, CH_4, CH_3OH etc. into electrical energy done in fuel cells.

USE : Any use Like in Automobiles Apollo space programme. 2

9. E°MF = E° Cathode – E° ANode

Here, *Cu* is Anode

Ag is Cathode

So Σ° = +0.80 – +.34

= + .46 V

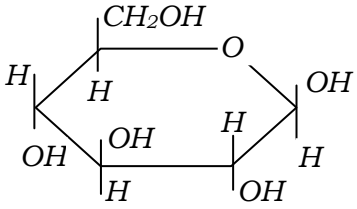
(Use standard reduction potential for both Electrode)

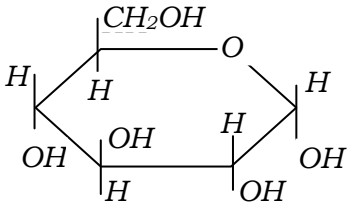
10. For correct reason of solubility of ethers. 2

11. These two are cyclic hemiacetal foams differs only at C_1 called Anomers. Six membered cyclic structure is called pyronose structure having one oxygen atom and five carbon atoms in the ring. 2

Pyran 1

,





β-D– (+) Glucopyronose

α-D– (+) Glucopyronose

12. Explanation for $SN^1 R_x$. 1

Explanation for $SN^2 R_x$. 1

For $SN^1 + SN^2 R_x$. $\frac{1}{2} + \frac{1}{2}$

13. Complete explanation showing movements of collide particles. 3

14. For each part $1\frac{1}{2} \times 2 = 3$

15. For each reaction $1 + 1 + 1 = 3$

16. (a) Self explanatory 3

(b) Self explanatory 2

OR

(a) Any three Abnormal properties of oxygen. 3

(b) Brief explanative will reason. 2

17. (a) For each correct Ionic or molecular reaction $1 \times 3 = 3$

(b) Correct reasons to form interstitial compounds. 2

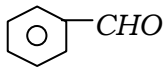
OR

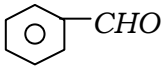
For any ***five*** important uses of d and f block elements for each use $1 \times 5 = 5$

18. (a) $HCOOH > C_6H_5COOH > CH_3COOH$ 1

Order of acidity [Indecrasing order]

Explanation for this order 2

(b) (i)  1

(ii)  1

OR

For Each part brief explanation with correct examples. $1\frac{1}{2} + 2 + 1\frac{1}{2} = 5$

(As mentioned in the question paper)