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Senior School Certificate Examination

March 2019

Marking Scheme – CHEMISTRY (SUBJECT CODE: 043)

(PAPER CODE – 56-1-1)

General Instructions: -

1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully. **Evaluation is a 10-12 days mission for all of us. Hence, it is necessary that you put in your best efforts in this process.**
2. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks be awarded to them.**
3. The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
4. If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled.
5. If a question does not have any parts, marks must be awarded in the left hand margin and encircled.
6. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
7. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
8. A full scale of marks 0-70 has to be used. Please do not hesitate to award full marks if the answer deserves it.
9. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 25 answer books per day.
10. Ensure that you do not make the following common types of errors committed by the Examiner in the past:-
    - Leaving answer or part thereof unassessed in an answer book.
    - Giving more marks for an answer than assigned to it.
    - Wrong transfer of marks from the inside pages of the answer book to the title page.
    - Wrong question wise totaling on the title page.
    - Wrong totaling of marks of the two columns on the title page.
    - Wrong grand total.
    - Marks in words and figures not tallying.
    - Wrong transfer of marks from the answer book to online award list.
    - Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.)
    - Half or a part of answer marked correct and the rest as wrong, but no marks awarded.

11. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as (X) and awarded zero (0) Marks.

12. Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.

13. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.

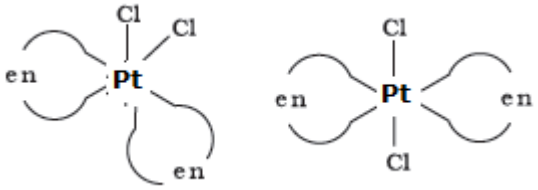
14. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.

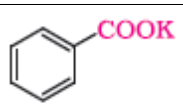
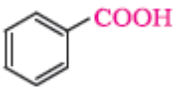
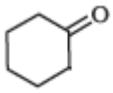
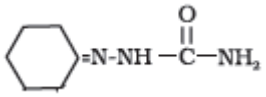
15. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

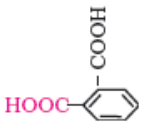
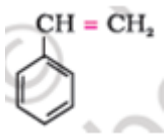
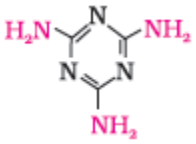
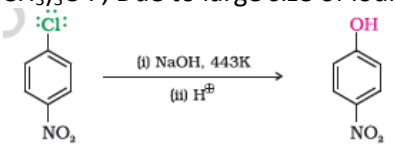
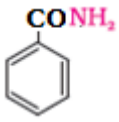
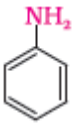
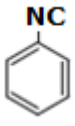
Marking scheme – 2019

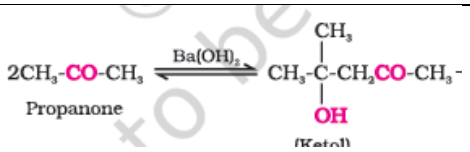
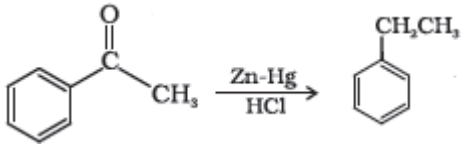
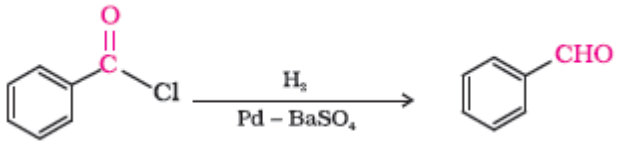
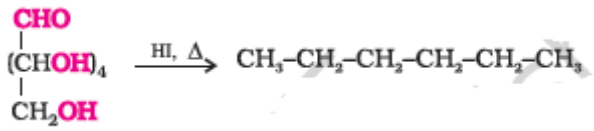
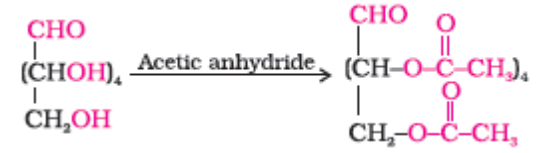
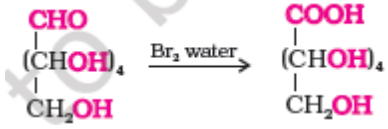
CHEMISTRY (043)/ CLASS XII

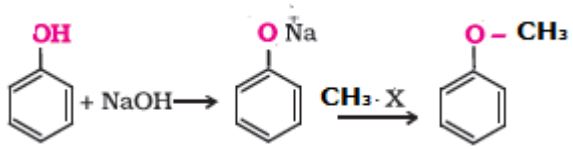
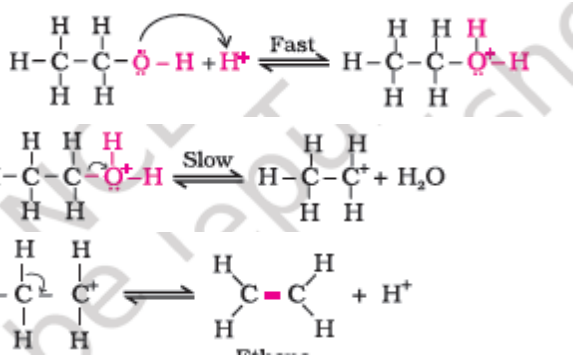
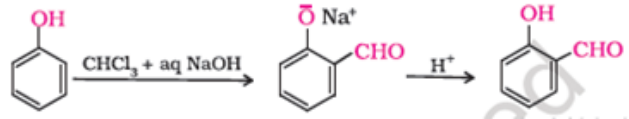
56/1/1

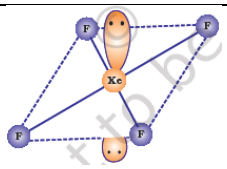
Q.No	Value Points	Marks
	SECTION A	
1	AgCl , Due to large difference in their size/ Due to small size of Ag^+ ion.	½ , ½
2	$(CH_3)_3N$ < $C_2H_5NH_2$ < C_2H_5OH	1
3	Due to large surface area these are easily assimilated or adsorbed.	1
	OR	
3	Emulsion – both dispersed phase and dispersion medium are liquid Gel- Dispersed phase is liquid while dispersion medium is solid	1
4	Nucleophiles having two nucleophilic centres. CN^- /SCN^- / NO_2^- (any one)	½ , ½
5	Glucose has aldehydic group while fructose has ketonic group/ Glucose is aldose while fructose is ketose.	1
	OR	
5	Glucose and Galactose	1
	SECTION B	
6	i) $2XeF_2\ (s) + 2H_2O(l) \rightarrow 2Xe\ (g) + 4\ HF(aq) + O_2(g)$ ii) $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$	1 1
	OR	
6	i) H_2O < H_2S < H_2Se < H_2Te ii) HF> HCl > HBr > HI	1 1
7	For a solution of volatile liquids, the partial vapour pressure of each component of the solution is directly proportional to its mole fraction present in solution. (i) $\Delta_{mix}H = 0$, (ii) $\Delta_{mix}V = 0$ (iii) The components have nearly same intermolecular force of attraction (any two)	1 ½, ½
8	i) Rate = k $[H_2O_2]$ $[I^-]$ ii) order = 2 iii) Step 1	1 ½ ½
9	A = K_2MnO_4 / MnO_4^{2-} , B= $KMnO_4$ / MnO_4^{--} , C= IO_3^- or KIO_3 , D= I_2	½ ×4
10.	Bis(ethan-1,2-diamine)dichloridoplatinum (II)  Cis Trans	1 ½ , ½
	OR	
10.	i) $[Co(NH_3)_6]_2(SO_4)_3$ ii)$K_3[Cr(ox)_3]$	1 1
11	i) $[CoF_6]^{3-}$ ii)$[Co(en)_3]^{3+}$ iii) $[Co(en)_3]^{3+}$ iv) $[CoF_6]^{3-}$	½ ×4

12	i) A=  B=  ii) A=  B= 	½ ×4
	SECTION C	
13	t= $\frac{[R]0-[R]t}{k}$ = $\frac{[0.1-0.064]}{4X\ 10^{-3}}$ = 9 s	1 1 1
14	i) Adsorption of toxic gases ii) Negative charge ; $Fe_2O_3.xH_2O/OH^-$ iii) Increases with increase in temperature/ First increases then decreases	1 ½ , ½ 1
15	d= $\frac{zm}{a^3\ N}$; m=Mass of element , N=number of atoms N = $\frac{108\ X\ 4}{10.8X27X10^{-24}}$ = 1.48 X 10^{24} atoms Or M= $\frac{a^3\ \times N_a \times d}{Z}$ = $\frac{27\times10^{-24}\times6.022\times10^{23}\times10.8}{4}$ = 43.88 g mol^{-1} 43.88 g mol^{-1} contains 6.02×10^{23} atoms So , 108 g contains = $\frac{6.02\times10^{23}\times108}{43.88}$ = 1.48×10^{24} atoms	1 1 1 ½ 1 ½ 1
16	$\Delta T_f = K_f\ m$ $K_f = \Delta T_f\ X\ \frac{M_2 x\ w_1}{w_2\ x1000}$ = $\frac{2x\ 342\ x\ 96}{4x1000}$ = 16.4 K $\Delta T_f = K_f\ m'$ = $K_f \frac{w_2\ x1000}{M_2 x\ w_1}$ = $\frac{16.4\ x\ 5\ x\ 1000}{95x180}$ = 4.8 K $\Delta T_f = T_f^o - T_f$ 4.8 = 273.15 - T_f T_f = 268.35 K	½ 1 1 ½

17	a) i)Zone refining ii)Distillation b) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$ $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$	½ , ½ 1 1
18	i) Due to variable oxidation state ii)Mn^{2+} is stable due to exactly half filled $3d^5$ configuration/ Due to high ΔaH^0 and low $\Delta hydH^0$for Cu^{2+} / Cu is positive. iii) Due to comparable energies of 5f , 6d and 7s orbitals.	1 1 1
19.	i) $HOOC(CH_2)_4COOH$, $H_2N(CH_2)_6NH_2$ ii) $HO\text{-}CH_2\text{-}CH_2\text{-}OH$,  iii) $CH_2 = CH - CH = CH_2$, 	1 ×3
	OR	
19	i) Homopolymers , single repeating unit ii)  , $HCHO$ (Or names of monomers) iii) Sulphur forms cross links at the reactive sites of double bonds and thus the rubber gets stiffened / To improve the physical properties of rubber by forming cross links.	½ , ½ 1 1
20.	i) Tranquilizers ii) Anionic detergents iii) It is difficult to control the sweetness.	1 1 1
	OR	
20.	i) Antibiotics which kill or inhibit a wide range of Gram-positive and Gram-negative bacteria. Example- Chloramphenicol (or any other) ii) The chemicals which either kill or prevent the growth of microorganisms when applied to inanimate objects such as floors, drainage system, instruments, etc.Example – 1% Phenol solution (or any other) iii) Cationic detergents are quarternary ammonium salts of amines with acetates, chlorides or bromides as anions where Cationic part is involved in cleansing action. Example – Cetyltrimethylammonium bromide (Or any other)	½ , ½ ½ , ½ ½ , ½
21	i) $(CH_3)_3C\text{-}I$, Due to large size of iodine / better leaving group / Due to lower electronegativity. ii)  iii) Because enantiomers have same boiling points / same physical properties.	½ , ½ 1 1
22	**A =**  **, B =**  **, C=**  A= Benzamide , B= Aniline , C= Phenylisocyanide / Benzeneisonitrile	½ ×6
23	i) $C_6H_5\text{-}CH(OH)\text{-}CN$ ii) $2\ CH_3COCH_2C_6H_5 + CdCl_2$ iii) $(CH_3)_2\text{-}C(Br)COOH$	1 1 1

	OR	
23	i)  ii)  iii)  	1 1 1
24	i) Amylose is water soluble component while amylopectin is water insoluble ii) Peptide linkage is –CONH- formed between two amino acids while glycosidic linkage is an oxide linkage between two monosaccharides. iii) In fibrous protein ,the polypeptide chains run parallel while in globular , the chains of polypeptides coil around to give a spherical shape (or any other correct difference.)	1 1 1
	OR	
24	i)  ii)  iii)  	1 1 1
	SECTION D	
25	$E_{cell} = E^{o}_{cell} - \frac{0.059}{n} \log K_c$ $= E^{o}_{cell} - \frac{0.059}{2} \log \frac{10^{-3}}{10^{-2}}$ $= 2.71 + 0.0295$ $E_{cell} = 2.7395$ V i)Cu to Mg / Cathode to anode / Same direction ii)Mg to Cu / Anode to cathode / Opposite direction	1 1 1 1 1
	OR	
25	(a) $m = z\,I\,t$ 2.8 g = $\frac{56 \times 2 \times t}{2 \times 96500}$ t= 4825 s / 80.417 min $\frac{m1}{m2} = \frac{E1}{E2}$	½ ½ ½ ½

	$\frac{2.8}{mZn} = \frac{56}{2} X \frac{2}{65.3}$ m_{Zn} = 3.265 g b) i)A- strong electrolyte , B-Weak electrolyte ii)Λ^0m for weak electrolytes cannot be obtained by extrapolation while Λ^0m for strong electrolytes can be obtained as intercept.	1 1 1
26	a) i)  ii) $CH_3CH_2OH \xrightarrow{PCC,Heat} CH_3\text{-}CHO \xrightarrow{i)CH3MgBr\ ii)H+} CH_3CH(OH)\text{-}CH_3$ (or any other correct method) b)  c) Due to involvement of lone pair of oxygen in delocalisation makes the benzene ring electron rich.	1 1 ½ ½ 1 1
	OR	
26	a) i) *o*-Nitrophenol is steam volatile due to intramolecular hydrogen bonding while *p*-nitrophenol is less volatile due to intermolecular hydrogen bonding. ii) Due to the formation of stable intermediate tertiary carbocation / CH_3O^- being a strong base favours elimination reaction.  b) i) ii) (Award 1 mark if attempted in any way) c) Add neutral $FeCl_3$ to both the compounds, phenol will give violet colouration while ethanol does not.	1 1 1 1 1
27	a) i) In vapour state sulphur partly exists as S_2 molecule which has two unpaired electrons like O_2 . ii) Due to greater interelectronic repulsion iii) Because decomposition of ozone into oxygen results in the liberation of heat (ΔH is negative) and an increase in entropy (ΔS is positive), resulting in large negative Gibbs energy change (ΔG) for its conversion into oxygen. b) i) NO gas/ Nitric oxide ii) NO_2 gas / Nitrogen dioxide	1 1 1 1,1
	OR	
27	a) i) $4H_3PO_3 \rightarrow 3H_3PO_4 + PH_3$	1

	ii)  b) i) Due to small size and low bond dissociation enthalpy ii) As the size increases, electronegativity decreases / non-metallic character decreases c) $5SO_2 + 2MnO_4^- + 2H_2O \rightarrow 5SO_4^{2-} + 4H^+ + 2Mn^{2+}$	1 1 1 1