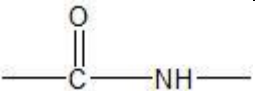


## Marking scheme – 2020

### CHEMISTRY (043)/ CLASS XII

56/2/3

Q.No	Expected Answer / Value Points	Marks
	<b>SECTION A</b>	
1	Peptide linkage/amide linkage/ 	1
2	Those which are not synthesized in our body or must be supplied through diet.	1
3	Simple organic compounds containing both carboxyl (—COOH) and amino (—NH <sub>2</sub> ) group. / Building blocks of protein. / Amino substituted carboxylic acid / structure	1
4	They contain both acid (-COOH) and basic(NH <sub>2</sub> ) group / Zwitter ion form or structure / It can react both acids and bases.	1
5	Acidic aminoacids- will have more number of carboxyl groups than amino groups. / Basic amino acids- will have more number of amino groups than carboxyl groups.	1
6	Hydraulic washing / gravity separation	1
7	Linkage	1
8	Desorption	1
9	Zinc / Mercury or any other suitable metal	1
10	1	1
11	(A)	1
12	(C)	1
13	(D)	1
14	(C)	1
15	(A)	1
16	(i)	1
17	(iii)	1
18	(iii)	1
19	(i)	1
20	(iii)	1
	<b>SECTION B</b>	
21	(a) Associated (b) Associated	1 1
22	Pt  I <sub>(aq.)</sub>   I <sub>2(s)</sub>    F <sub>2(g)</sub>   F <sub>(aq.)</sub>   Pt (Pt may be ignored)  $E_{\text{cell}} = E_{\text{cell}}^0 - \frac{0.059}{2} \log \frac{[F^-]^2}{[I^-]^2}$	1  1
23	a) $5\text{Fe}^{2+} + \text{MnO}_4^- + 8\text{H}^+ \rightarrow \text{Mn}^{2+} + 4\text{H}_2\text{O} + 5\text{Fe}^{3+}$ b) $2\text{MnO}_4^- + 3\text{Mn}^{2+} + 2\text{H}_2\text{O} \rightarrow 5\text{MnO}_2 + 4\text{H}^+$	1 1

24	<p>a) Tranquilizers: Used to treat mild to severe mental diseases.</p> <p>b) Antiseptics- are applied to living tissues.</p> <p style="text-align: center;"><b>OR</b></p> <p>Cationic detergent-are quaternary ammonium salts of amines with acetates, chlorides or bromides as anions. e.g. cetyltrimethyl ammonium bromide.</p>	<p>Analgesics: Used to reduce pain</p> <p>Disinfectants – are applied to inanimate objects or non living objects (or any other correct difference)</p> <p>Anionic detergent – are sodium salts of sulphonated long chain alcohols or hydrocarbons. e.g. Sodium lauryl sulphate / sodium dodecyl benzene sulphonate. (or any other suitable example)</p>	<p>1</p> <p>1</p> <p>1</p> <p>½ + ½</p>
25	<p>(a) Due to lone pair -lone pair repulsion on oxygen.</p> <p>(b) Due to resonance in phenol and not in methanol / <math>sp^2</math> hybridised carbon atom in phenol / <math>sp^3</math> hybridised carbon atom in methanol.</p>		<p>1</p> <p>1</p>
26	<p>The curve obtained by plotting the amount of gas adsorbed by the adsorbent with pressure at constant temperature. <math>x/m = kp^{1/n}</math></p> <p style="text-align: center;"><b>OR</b></p>		<p>1</p> <p>1</p>
26	<p>The catalytic reaction that depends upon the pore structure of the catalyst and the size of the reactant and product molecules. Shape selective catalysis / Catalytic dehydration .</p>		<p>1</p> <p>1</p>
27	<p>Rate = <math>k[A][B]</math> Average rate - Rate of a reaction for a particular period or interval of time. Instantaneous rate - Rate of a reaction at a particular instant of time. (or any other suitable difference)</p>		<p>1</p> <p>½</p> <p>½</p>
<b>SECTION C</b>			
28	<p>a) <math>CH_2 = C(CH_3) - CH = CH_2</math> b) <math>CH_2 = CH - CH = CH_2</math> and <math>C_6H_5 - CH = CH_2</math> c) <math>C_6H_5 - OH</math> and <math>HCHO</math></p> <p style="text-align: center;"><b>OR</b></p>		<p>1</p> <p>1</p> <p>1</p>
28	<p>i) Ethylene glycol and Terephthalic acid ii) Tetrafluoro ethene iii) <math>\beta</math>-Hydroxy butyric acid and <math>\beta</math>-Hydroxy valeric acid / 3-Hydroxybutanoic acid and 3-Hydroxypentanoic acid</p>		<p>1</p> <p>1</p> <p>1</p>
29	<p><math>4 Ag + 8CN^- + 2H_2O + O_2 \rightarrow 4[Ag(CN)_2]^- + 4OH^-</math></p> <p><math>2 [Ag(CN)_2]^- + Zn \rightarrow [Zn(CN)_4]^{2-} + 2 Ag</math></p> <p>Zn acts as a reducing agent.</p>		<p>1</p> <p>1</p> <p>1</p>
30	<p>Limiting molar conductivity of an electrolyte can be represented as the sum of the individual contributions of the anion and cation of the electrolyte. Molar conductivity of <math>Ba(OH)_2 = \lambda^{\circ} Ba^{2+} + 2 \lambda^{\circ} OH^-</math> <math>= 127 + (2 \times 199)</math> <math>= 525 Scm^2/mol</math> (deduct ½ mark if no or incorrect unit)</p>		<p>1</p> <p>½</p> <p>½</p> <p>1</p>

31	$\Delta T_f = K_f m$ $= 1.86 \times 31 \times 1000 / 62 \times 600$ $= 1.55^\circ\text{C or K}$ $\Delta T_f = T_f^\circ - T_f$ $T_f = -1.55^\circ\text{C or } T_f = 271.45\text{K or } 271.6\text{K}$	$\frac{1}{2}$ $\frac{1}{2}$ 1 1
	(deduct $\frac{1}{2}$ mark if no or incorrect unit)	
32	(a) the lone pair of nitrogen in aniline is in resonance or conjugation with the benzene ring. (b) Aniline forms salt with anhydrous $\text{AlCl}_3$ . (c) As only alkyl halides undergo nucleophilic substitution.	1 1 1
33	(a) Potassiumhexacyanomanganate(II) / Potassiumhexacyanomanganate(II) $t_{2g}^5 e_g^0$ (b) Increased stability of the complex due to presence of chelating or didentate or polydentate ligands. e.g. $[\text{Cr}(\text{en})_3]^{3+}$	1 1 $\frac{1}{2}$
	(or any other suitable example.)	$\frac{1}{2}$
	<b>OR</b>	
33	(i) $d^2 sp^3$ , diamagnetic (ii) $sp^3 d^2$ , paramagnetic (iii) $sp^3$ , diamagnetic	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$
34	a) ethyl chloride < isopropyl chloride < tertiarybutyl chloride Due to increasing stability of carbocation	1 $\frac{1}{2}$
	b) tertiarybutylchloride < isopropylchloride < ethylchloride Due to decreasing steric hindrance.	1 $\frac{1}{2}$
<b>SECTION D</b>		
35	a) A = $\text{S}_8$ , B = $\text{SO}_2$ , C = $\text{SO}_3$ , D = $\text{H}_2\text{S}_2\text{O}_7$ , E = $\text{H}_2\text{SO}_4$ , F = $\text{CuSO}_4$ b) $\text{Cu} + 2\text{H}_2\text{SO}_4 \rightarrow \text{CuSO}_4 + \text{SO}_2 + 2\text{H}_2\text{O}$ c) dehydrating agent, oxidising agent, electrolyte and catalyst	$\frac{1}{2} \times 6$ 1 $\frac{1}{2} \times 2$
	<b>OR</b>	
35	(a) (i) readily accept one electron to attain noble gas configuration (ii) due to weak dispersion forces / vander Waal forces. (iii) due to smaller size of oxygen as compared to chlorine / due to higher electron density on O than on Cl / due to larger size of chlorine as compared to oxygen.	1 1 1
	(b) (i) $2\text{NaOH} + \text{Cl}_2 \rightarrow \text{NaCl} + \text{NaOCl} + \text{H}_2\text{O}$ (cold, dil.)	1
	(ii) $2\text{I}^-_{(\text{aq.})} + \text{H}_2\text{O}_{(\text{l})} + \text{O}_3_{(\text{g})} \rightarrow \text{I}_{2(\text{s})} + \text{O}_{2(\text{g})} + 2\text{OH}^-_{(\text{aq.})}$	1
36	a) A = $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$ / pentan-3-one $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3 \xrightarrow{\text{Zn-Hg, HCl(conc.)}} \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$	1 1
	b) i) $\text{CH}_3\text{CH}_2\text{COOH} + \text{Br}_2 \xrightarrow{\text{Red P}} \text{CH}_3\text{CHBrCOOH}$	1

36	<p>ii)</p> <div style="text-align: center;"> <p>Benzoyl chloride <math>\xrightarrow[\text{Pd - BaSO}_4]{\text{H}_2}</math> Benzaldehyde</p> </div> <p>c) On heating with NaOH / I<sub>2</sub>, acetaldehyde will give yellow ppt of CHI<sub>3</sub>, while benzaldehyde doesn't. (or any other suitable chemical test)</p> <p style="text-align: center;"><b>OR</b></p> <p>a) i) A = (CH<sub>3</sub>)<sub>2</sub>CH(OH) CH<sub>2</sub> COCH<sub>3</sub>, B = (CH<sub>3</sub>)<sub>2</sub>CH=CH COCH<sub>3</sub>, C and D =CHI<sub>3</sub> and (CH<sub>3</sub>)<sub>2</sub>CH=CH COONa</p> <p>ii) 4-Hydroxy-4-methylpentan-2-one</p> <p>b) i) Propanone will give yellow coloured solution with 2,4-DNP but ethanol doesn't. (or any other suitable chemical test)</p> <p>ii) benzoic acid will give brisk effervescence with NaHCO<sub>3</sub> but phenol doesn't. (or any other suitable chemical test)</p>	<p>1</p> <p>1</p> <p>½ x 4</p> <p>1</p> <p>1</p> <p>1</p>
37	<p>(a) (i) zero order (ii) slope = - k (iii) molL<sup>-1</sup>s<sup>-1</sup></p> <p>(b) <math>k = \frac{2.303}{t} \log \frac{[A_0]}{[A]}</math>  <math>= \frac{2.303}{25} \log \frac{100}{75}</math>  <math>= \frac{2.303}{25} \log \frac{4}{3}</math>  <math>= \frac{2.303}{25} (0.6021 - 0.4771)</math>  <math>= 0.0115 \text{ min}^{-1}</math>  <math>t_{1/2} = \frac{0.693}{k} = \frac{0.693}{0.0115}</math>  <math>= 60.26 \text{ min or } 60.2 \text{ min}</math></p> <p style="text-align: right;">(or by any other suitable method) (deduct half mark for no or incorrect unit)</p> <p style="text-align: center;"><b>OR</b></p> <p>(a) <math>t = \frac{2.303}{k} \log \frac{[A_0]}{[A]}</math>  <math>= \frac{2.303}{60} \log \frac{1}{1/16}</math>  <math>= 0.046 \text{ s}</math></p> <p style="text-align: right;">(or by any other suitable method) (deduct half mark for no or incorrect unit)</p> <p>(b) Concentration of reactants, Temperature, Pressure, surface area and catalyst (any two factors )</p> <p>(c) Proper orientation and energy should be equal to or greater than threshold energy.</p>	<p>1</p> <p>1</p> <p>1</p> <p>½</p> <p>½</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>