

Sub: Chemistry 2nd paper (Creative)

Sub Code : **177**

Time: 2 Hrs 10 min

Full marks: 40

[Answer any four questions]

1. ► At 25°C temperature 400 mL A gas at 750 mm pressure, 600 mL B gas at 700 mm pressure and 200 mL C gas at 760 mm pressure are mixed into 2500 mL empty container. Critical temperature of A, B and C gasses are 31. 1°C, - 118.80° C. and -240° C respectively.

- What is Dalton's law of partial pressure? 1
- The volume of ideal gas becomes zero at absolute zero temperature Explain 2
- Determine the total pressure of the gas mixture 3
- Which gas of the stem can be liquefied easily and which cannot? Explain 4

2. ► C₄H₁₀O is the molecular formula of three different alcohols 'A' 'B' and 'C' which react with Lucas reagent producing different alkyl halides and 'A' 'B' and 'C' can be distinguished by using this reagent

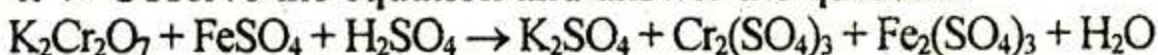
- What is isomer? 1
- Alkynes -1 are acidic in nature Explain 2
- How will you distinguish among 'A' 'B' and 'C' on the basis of their oxidation Product. 3
- Explain the relative rate of 'A' 'B' and 'C' with lucas reagent mentioning their reactions. 4

3. ► An organic compound 'A' is oxidized to compound 'B'. The compound 'B' produces yellow precipitate with 2,4-di nitrophenyl and produces silver mirror with Tollens reagent Two carbon atoms present in 'B'.

- What is carbonyl compound? 1
- The boiling point of alcohols are much more higher than those of the corresponding alkanes. Explain. 2
- Does the compound 'B' gives aldol condensation reaction? Write the reaction with mechanism. 3

d. Write the name and formula of compound 'A' and 'B' with related reaction which is mention in the stem and give arguments in the light of your answer. 4

4. ► Observe the equation and answer the question



- What is oxidation number? 1
- What do you mean by solution pressure and osmotic pressure? 2
- Balance the mentioned reaction by ion electron method 3
- How much gram of oxidizing agent will be needed to neutralize 10 gm of FeSO₄ Calculate with logic. 4

5. ► 49 gm of H_2SO_4 is dissolved in 500 mL solution. This acid solution is neutralized by 5% of NaOH
- What is called indicator? 1
 - Decimolar solution is a standard solution Explain 2
 - Find out the molarity of the acid solution. 3
 - How much volume of NaOH solution needed to neutralize the whole volume of acid solution mention in the stem. 4
6. ► The standard reduction potential of the electrodes of $\text{Zn}^{2+}/\text{Zn(s)}$ and $\text{Cu}^{2+}/\text{Cu(s)}$ are -0.76 V and + 0.34V.
- What is chemical equivalent? 1
 - Electrolysis is an oxidation reduction process-Explain. 2
 - Form a cell with the mentioned electrode and write the reaction for the cell. 3
 - ZnSO_4 solution kept in a copper container or CuSO_4 solution kept in a zinc container which one is more feasible? Explain with logic. 4

Model Question of HSC Examination 2017 (All Board)

Sub – Chemistry (MCQ)

Sub Code : 177

Time : 35 Minutes

Full Marks : 35

[N.B. Fill the circle of the correct answer with a black ball point pen. Each question bears 1 mark.]

1. What is the value of R in SI unit?

- (a) $0.0821 \text{ Latm K}^{-1} \text{ mole}^{-1}$
 (b) $8.316 \text{ J K}^{-1} \text{ mole}^{-1}$
 (c) $0.0821 \text{ erg mole}^{-1}$
 (d) $8.316 \text{ erg mole}^{-1}$

Give the answer of the question 2 & 3 according to the following Chemical equation
 Lead (II) oxide + Hydrogen = Lead + steam

2. Which substance is being oxidizing agent?

- (a) Lead (II) oxide (b) Hydrogen
 (c) Lead (d) Steam

3. Which substance is being reduced?

- (a) Lead (II) oxide (b) hydrogen
 (c) Lead (d) Steam

4. What is the strength of a solution of 10% (w/v) Na_2CO_3 solution in molarity?

- (a) 0.05M (b) 0.94M
 (c) 1.25M (d) 1.50M

5. The E° Cell given by the reaction—

- (a) $E^\circ_{\text{anode (ox)}} - E^\circ_{\text{cathode (ox)}}$
 (b) $E^\circ_{\text{cathode (ox)}} - E^\circ_{\text{anode (ox)}}$
 (c) $E^\circ_{\text{cathode (ox)}} + E^\circ_{\text{anode (ox)}}$
 (d) $E^\circ_{\text{anode (red)}} + E^\circ_{\text{cathode (red)}}$

6. The amount of electricity needed to deposit 1 mole of Al from a solution of AlCl_3 is—

- (a) 0.33F (b) 1F
 (c) 1.33F (d) 3F

7. In galvanic cell—

- i. anode is negatively charged
 ii. Cathode is positively charged
 iii. reduction occurs at anode

Which one of the following is correct?

- (a) i & ii (b) i & iii
 (c) ii & iii (d) i, ii & iii

4. 4 g of a gas at S. T.P occupies a volume of 2.24 L. Give the answer of the question 8 & 9 according the above statement

8. What is the formula of the gas

- (a) CO (b) CO_2
 (c) NO_2 (d) SO_2

9. How many molecules are present in the gas?

- (a) 6.02×10^{22} (b) 6.20×10^{22}
 (c) 6.02×10^{23} (d) 6.20×10^{23}

10. What is the electrochemical equivalent weight in gm) of Ag?

- (a) 0.00001044 (b) 0.0001201
 (c) 0.0001117 (d) 0.001118

11. What is the oxidation number of S in $\text{H}_2\text{S}_2\text{O}_7$?

- (a) -6 (b) -12
 (c) +6 (d) +12

12. What is the suitable indicator for neutralization of Na_2CO_3 and HCl?

- (a) Methyl orange (b) Litmus
 (c) Phenolphthelin (d) Phenol red

13. $\text{HCl}_{(\text{aq})} + \text{NH}_3_{(\text{aq})} = \text{NH}_4^+_{(\text{aq})} + \text{Cl}^-_{(\text{aq})}$ in this reaction

- i. HCl is an acid
 ii. NH_4^+ is a conjugate acid
 iii. Cl^- is a conjugate acid

Which one of the following is correct?

- (a) i & ii (b) ii & iii
 (c) i & iii (d) i, ii & iii

14. Phenol reacts with chloroform in presence of NaOH at $60 - 70^\circ\text{C}$ to form Salicyldehyde. The name of the reaction is

- (a) Rosenmund reaction
 (b) Reimer-Tieman reaction
 (c) Friedel-Craft reaction
 (d) Carbylamin reaction

Answer the question 15 & 16 according to the following stem



15. Which one of the following is used to detect Y?

- (a) Salicylic acid (b) Primary amine
 (c) Picric acid (d) Tollen's reagent

16. Which one of the following gas is passed through Y as a result a medicine of rheumatic fever and pain in urinary tract is produced?

- (a) ammonia (b) methane
 (c) ethylene (d) chlorine

17. Which one of the following is the most acidic?

- (a) CH_2FCOOH (b) CH_2ClCOOH
 (c) CH_2BrCOOH (d) CH_3COOH

18. Benzene diazonium chloride when reacts with copper in presence of HCl produce—

- (a) Benzene (b) Phenol
(c) Toluene (d) Chlorobenzene

C_4H_8 is the molecular formula of both A and B compounds. The compound A has two forms while B has only one.

19. The compound A exhibit the isomer is
i. cis-isomer
ii. Trans isomer
iii. optical isomer

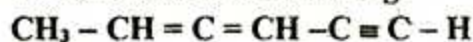
Which one of the following is correct?

- (a) i & ii (b) ii & iii
(c) i & iii (d) i, ii & iii

20. What is the IUPAC name of B

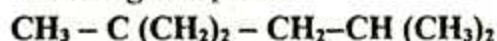
- (a) But-1-ene (b) But-3-ene
(c) But-3-yne (d) But-1-yne

21. What is the total number of sigma bonds found in the following?



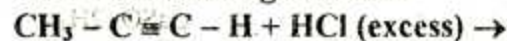
- (a) 8 (b) 10
(c) 11 (d) 15

22. What is the IUPAC name for the following compound?



- (a) 1, 3-pentamethyl propane
(b) 2, 4, 4-tetramethyl pentane
(c) 2, 4, 4-trimethyl pentane
(d) 2, 2, 4-trimethyl pentane

23. What is the major product expected from the following reaction?



- (a) $CH_3 - CCl = CH_2$
(b) $CH_3 - CH = CHCl$
(c) $CH_2 = CH_2 - CHCl_2$
(d) $CH_3 - CCl_2 - CH_2$

24. +I effect is shown by

- (a) $-NO_2$ (b) $-Cl$
(c) $-Br$ (d) $-CH_3$

25. An organic compound X is oxidised by using acidified $K_2Cr_2O_7$. The product obtained reacts with phenyl hydrazine but does not give silver mirror test. The possible structure of X is

- (a) $(CH_2)_2CHOH$ (b) CH_3CHO
(c) CH_3CH_2OH (d) CH_3OCH_3

26. Which of the following gives an aldehyde on dry distillation?

- (a) calcium acetate + calcium benzoate
(b) calcium formate + calcium acetate
(c) calcium benzoate + calcium acetate
(d) calcium acetate

27. In lead storage cell which is used as electrolyte?

- (a) H_2SO_4 (b) $PbSO_4$
(c) PbO_2 (d) Pb

28. Which electrode of the following represent reduction electrode?

- (a) Fe/Fe^{2+} (b) Cu^{2+}/Cu
(c) Zn/Zn^{2+} (d) $Pt, H_2/H^+$

29. Shohel burnt some amount of lime stone and obtained 17 gm residue. What is the amount of lime stone burnt?

- (a) 30.26 (b) 30.35
(c) 32.14 (d) 44.56

30. Which of the following act as an electrophile?

- (a) BF_3 (b) NO_2
(c) Br (d) NH_3

31. As per recommendation by WHO which one of the following tolerable standard limit of arsenic for human body?

- (a) 0.05 mg/L (b) 0.07 mg/L
(c) 0.9 mg/L (d) 0.15

32. How many coal fields are there in Bangladesh?

- (a) 3 (b) 4
(c) 5 (d) 6

33. Which one of the following is the functional group of amide?

- (a) $-CHO$ (b) $-CONH_2$
(c) $-C \equiv N$ (d) $-COOC$

34. Ozone is present in which atmospheric zone?

- (a) Troposphere (b) Stratosphere
(c) Mesosphere (d) Thermosphere

35. Paper is manufactured from which type of substance?

- (a) Polymer (b) Cellulose
(c) Plastic (d) Aldehyde