

MODEL QUESTION SET 2076

Class: 11
Subject: Chemistry

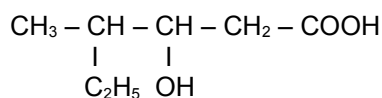
Full Mark: 75
Time: 3 hours

Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

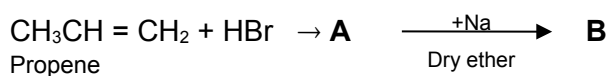
Group A

Attempt any **fifteen** questions: **(15 × 2= 30)**

- Carbon is found to form two oxides A and B; which contain 42.9% and 27.3% of carbon respectively. Find the parts by weight of oxygen that combine with 1 part by weight of carbon. Which chemical law can be illustrated from these data?
- An atom of an element 'A' weights 3.985×10^{-23} gm. Find its equivalent weight if it can form oxide of 'AO' type.
- Find the volume occupied by the gaseous mixture of 4.4 gm CO₂ and 6.4 gm of O₂ at NTP.
- Define efflorescent and hygroscopic substance with example.
- State Hund's rule. Write an example to mention that this rule is also called rule of maximum multiplicity.
- Write the electronic configuration of Zn²⁺. Also give the value of 'n' and 'l' for last electron of Zn.
- What are nuclear isotopes? Write an example of such isotope with its use.
- Can a molecule be non-polar in nature even it contain polar covalent bonds? Describe with example to support your answer.
- Write Lewis structure of (i) H₃BO₃ (ii) Na₂SO₄.
- Define ionization energy. Generally successive ionization energy value increases but why Mg has low value of second ionization energy than first ionization energy?
- Find the oxidation number of (i) H in LiAlH₄ (ii) Fe in K₄[Fe(CN)₆].
- Express the equilibrium constant for given equation:
 $2\text{HI}_{(g)} \rightleftharpoons \text{I}_{2(g)} + \text{H}_{2(g)}$; $\Delta H = +ve$
Also, mention the proper condition of temperature and pressure to maintain the forward reaction.
- Write the differences between nascent hydrogen and atomic hydrogen.
- What are oxides? Classify the given oxides:
(i) SO₃ (ii) ZnO
- Compare the bleaching action of Cl₂ with SO₂.
- What is meant by acid rain? Write about its adverse effect.
- Point out the main difference between (i) Roasting and Calcination (ii) Flux and Slag.
- How would you obtain plaster of paris from quick lime?
- Why sodium extract is prepared during detection of foreign element in the organic compound? What is the constituent of Lassaigne's solution if an organic compound contains nitrogen?
- i. Write the IUPAC name of:



- ii. Write the structural formula of 2-methoxy butane.
- Identify the major products A and B with their IUPAC names:



- Explain the chemistry involved in the Baeyer's test of unsaturation.

Group B

Attempt any **five** questions: **(5 × 5 = 25)**

23. Urea (NH_2CONH_2) is prepared by reacting carbon dioxide (CO_2) with ammonia (NH_3) along with side product water (H_2O).
When 1.14 kg of carbon dioxide is treated with 0.84 kg of ammonia, find the following.
- Which one is the limiting reagent?
 - Calculate the mass of urea formed.
 - Find the mass of excess reagent left.
 - Find the number of moles of water formed. (2+1+1+1)
24. Write the limitations of Rutherford's atomic model. How Bohr overcome those defects in his atomic model? Explain on the basis of postulates given by Bohr. (1+4)
25. Define oxidant and reductant. Balance the given equation either by oxidation number method or by ion-electron method.
 $\text{KMnO}_4 + \text{HCl} \rightarrow \text{KCl} + \text{MnCl}_2 + \text{H}_2\text{O} + \text{Cl}_2$ (1+4)
26. Describe the Ostwald's process of manufacture of nitric acid. Why iron seems passive towards conc. nitric acid? (4+1)
27. Explain laboratory method of preparation of hydrogen chloride. Why HBr and HI cannot be prepared by the same method applied for preparation of HCl? (4+1)
28. What happens when (1x5)
- ammonia in excess is treated with copper sulphate solution?
 - carbon monoxide is passed to hot finely divided nickel?
 - white phosphorus is heated with concentrated solution of sodium hydroxide?
 - H_2S gas is passed into acidified potassium permanganate solution?
 - SO_2 gas dissolved in water?
29. Describe how ethene gas can be prepared at laboratory? Write about a chemical test that helps to distinguish ethene from ethyne? (4+1)

Group C

Attempt any **two** questions: (2 × 10 = 20)

30. a. State and explain Charles' law to derive the mathematical equation that introduced Kelvin scale of temperature. Define absolute zero. (4+1)
b. What is meant by ideal gas? At what condition of temperature and pressure, an ideal gas show real behaviour? An iron cylinder contains butane at a pressure of 2500 mm of Hg at 20°C . The cylinder can withstand 10,000 mm of Hg pressure. If the room catches fire, predict whether the cylinder will melt or blow up. [Given: mp of iron = 1525°C] (1+1+3)
31. Describe the principle and process involved in manufacture of sulphuric acid by contact process with a flow sheet diagram. Explain why (i) sulphuric acid is a viscous liquid? (ii) aqueous sulphuric acid conduct electricity? Write suitable example to show conc. sulphuric acid is (i) a dehydrating agent (ii) oxidizing agent? (6+2+2)
32. a. Explain the extraction of sodium by Down's process. Can aqueous sodium chloride be used for extraction of sodium? Give reason. (5+1)
b. Write only the principle involved in manufacture of washing soda by Solvay's process. How sodium carbonate is converted into caustic soda? (3+1)
33. Write short notes on (any two): (2x5)
- Features of modern periodic table
 - Law of mass action
 - Chemistry of bleaching powder
 - Homologous series