

K-2-Y

Roll No. 1139202

Total No. of Questions : 27]

[Total No. of Printed Pages : 7

XIKDRO/N19

25502-Y

CHEMISTRY

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Time : 3 Hours]

[Maximum Marks : 70

General instructions :

- (i) All questions are compulsory
- (ii) Question nos. 1 to 5 are very short answer type questions and carry 1 mark each.
- (iii) Question nos. 6 to 12 are short answer type questions and carry 2 marks each.
- (iv) Question nos. 13 to 24 are also short answer type questions and carry 3 marks each.
- (v) Question nos. 25 to 27 are long answer type questions and carry 5 marks each.
- (vi) Use log table if necessary. Use of calculators is not allowed.

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Turn Over

(Very Short Answer Type Questions)

1 each

1. ✓ Write the formula of the compound Iron (III) sulphate.
2. ✓ $\text{NaH} + \text{H}_2\text{O} \longrightarrow \text{NaOH} + \text{H}_2$. In this reaction NaH is :

- (A) Oxidised
- (B) Reduced
- (C) Neither oxidised nor reduced
- (D) None of these

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3. ✓ Which has greater entropy at 400 K (N_2 or NH_3)
4. ✓ Name two heterocyclic aromatic compounds.

5. ✓ Write IUPAC name of $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH}$. *propan-1-ol*

(Short Answer Type Questions)

2 each

6. ✓ What is difference between the mass of a molecule and molecular mass.
7. ✓ Calculate the wavelength of an electron moving with a velocity of $2.05 \times 10^7 \text{ ms}^{-1}$.

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8. Which of the following pairs of elements have a more negative electron gain enthalpy :

(i) O or F

(ii) F or Cl

9. How do you express the bond length in terms of bond order ?

10. Write chemical reactions to show amphoteric nature of water.

11. What are DDT and BHC ?

Or

Name some hydrocarbon pollutants.

12. What are electron deficient compounds ? Is BCl_3 electron deficient species ?

Explain.

(Short Answer Type Questions)

3 each

13. Determine the molecular formula of an oxide of iron in which the mass percent of iron and oxygen are 69.9 and 30.1 respectively. Given that molar mass of the oxide is 159.8.

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Turn Over

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14. State and explain Hund's rule of maximum spin multiplicity.

15. Explain :

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(i) Covalent radius

(ii) Van der Waals' radius

(iii) Ionic radius.

16. What is bond order ? Give its significance.

17. A balloon is filled with hydrogen at room temperature. It will burst if the pressure exceeds 0.2 bar. If at 1 bar pressure the gas occupies 2.27 L volume, upto what volume can the balloon be expanded ?

18. Define Charles' law. How does it lead to the concept of absolute zero ?

19. State Hess's law. How does it follow the first law of thermodynamics ?

20. How will you prepare the following ?

(i) Sodium carbonate from sodium chloride

(ii) Sodium cyanide from sodium metal

(iii) Sodium silicate from silica.

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21. Teacher asked Hema to perform test for unsaturation in the laboratory for ethylene gas. She took some chlorine water in a test tube and passed the vapours of the gas through it. Nothing happened. Teacher asked her to pass the vapours of the gas into bromine water. The orange colour of bromine immediately discharged :

(i) What was the mistake committed by Hema ?

(ii) How did teacher help her ?

(iii) Write chemical equation for the reaction.

22. What happens, when :

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(i) Magnesium is burnt in air

(ii) Quick lime is heated with silica

(iii) Chlorine reacts with slaked lime ?

23. What are silicones, silicates and zeolites ?

24. On Complete combustion 0.246 g of an organic compound gave 1.98 g of carbon dioxide and 0.1014 g of water. Determine the percentage composition of carbon and hydrogen in the compound.

Or

(i) Why is it necessary to use acetic acid and not sulphuric acid for acidification of sodium extract for testing sulphur by lead acetate test ?

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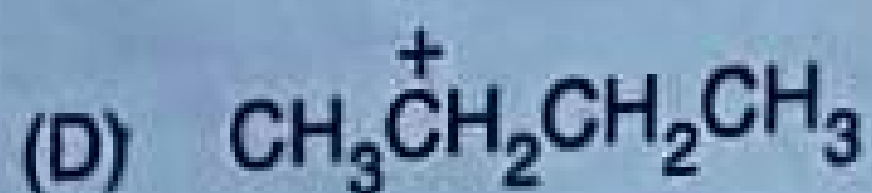
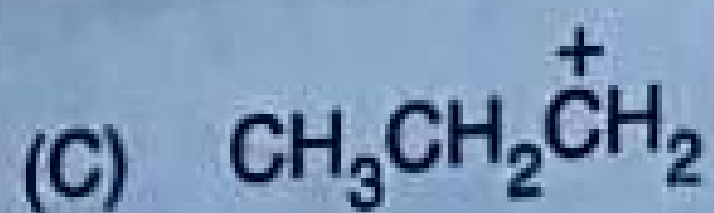
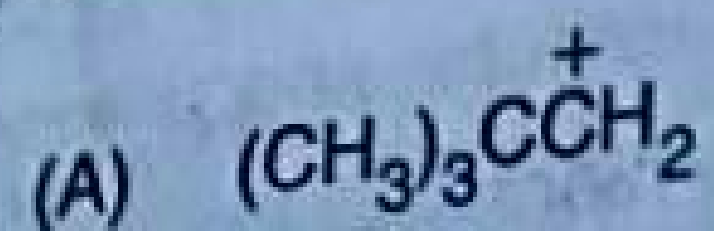
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Turn Over

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(ii) Which of the following carbocations is most stable ?



(iii) Name a suitable technique of separation of the components from a mixture of calcium sulphate and camphor.

(Long Answer Type Questions)

5 each

25. Explain inductive and electromeric effect with examples.

Or

How are nitrogen, sulphur and halogens identified in an organic compound ?

Give equations for the chemical reactions.

26. (i) An alkene 'A' on ozonolysis gives a mixture of ethanal and pentan-3-one. Write the structure and IUPAC name of 'A'.

(ii) Why is Wurtz reaction not preferred for the preparation of alkanes containing odd number of carbon atoms ?

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(7)

Or

Write chemical equations for the combustion reactions of the following hydrocarbons :

(A) Butane

(B) Pentene

(C) Hexyne

(D) Toluene

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27. State and explain Le Chatelier's principle. Which factors can alter the equilibrium state ?

Or

50 ml of 0.001 N HCl and 10 ml of 0.01 N H_2SO_4 are mixed together.

Calculate pH of resulting solution.

23
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