



Nagarjuna Degree College
38/36, Ramagondanahalli,
Yelahanka Hobli,
Bengaluru - 560 064.

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Reg. No.

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III Semester B.Sc. Degree Examination, April -2022

CHEMISTRY

(CBCS Semester Scheme 2018-19 onwards prior to 2021-22 Repeaters)

Paper : III

Time : 3 Hours

Maximum Marks : 70

Instructions to candidates :

- 1) The question paper carries two parts. Answer both the parts.
- 2) Draw diagrams and write chemical equations wherever necessary.

PART - A

Answer any **Eight** questions. Each question carries **2** marks.

(8×2=16)

1. Define temperature coefficient of reaction.
2. State second law of thermodynamics.
3. Calculate the thermodynamic efficiency of a steam engine working between temperatures 393k and 298k.
4. Define residual entropy.
5. What are Ellingham's diagrams?
6. Write any two uses of Bleaching powder.
7. What are thermosetting plastics? Give two examples.
8. Give the reaction of an alcohol with metallic sodium.
9. What are Grignard reagents? Give an example.
10. Give the preparation of diethyl ether from ethanol.
11. How are fertilizer's classified?
12. Give two differences between physisorption and chemisorption.

PART - B

Answer any **Nine** questions. Each question carries **6** marks.

(9×6=54)

13. a) Derive an expression for the rate constant of a second order reaction $A + B \rightarrow$ products where the concentration of the reactants A and B are same.
b) Write Arrhenius equation and indicate the terms involved in it. **(4+2)**
14. a) Explain half life method for determining the order of a reaction.
b) The half life period for a second order reaction is 30mins. Calculate the velocity constant when the initial concentration of the reactant is 0.02 mol/dm^3 . **(4+2)**

[P.T.O.]



15. a) Derive an expression for work done in an isothermal reversible expansion of a gas.
b) Define entropy of a substance. Mention its unit. (4+2)
16. a) Derive an expression for thermodynamic efficiency of a heat engine.
b) Define irreversible process. (4+2)
17. a) What is Spontaneous process? Give an example. What is the criteria for the spontaneity of a process in terms of free energy change?
b) State Nearest heat theorem. (4+2)
18. a) What are Homogenous and Heterogeneous catalysis? Give one example for each.
b) Write BET equation. Explain the terms involved. (4+2)
19. a) Explain addition and condensation polymerisation with an example for each.
b) Define the term weight average molecular weight of a polymer. (4+2)
20. a) Explain Mond's process of refining Nickel.
b) What are Silicones? Mention its uses.
c) Mention the monomers used in the synthesis of Nylon-6,6. (2+2+2)
21. a) Describe the extraction of uranium from pitch blende.
b) Write the partial structure of Teflon. (4+2)
22. a) Explain the Luca's test to distinguish between primary secondary and tertiary alcohol.
b) What happens when glycerol is heated with potassium hydrogen Sulphate. (4+2)
23. a) How is primary alcohol prepared from
i) Alkene and
ii) Aldehyde
b) Give one method of prepreparation of Glycol from ethylene. (4+2)
24. a) Explain the mechanism of Reimer-Tiemann reaction.
b) How is methyl lithium converted to ethanoic acid? (4+2)
25. a) What is Williamson's ether synthesis.
b) What are epoxides? Give an example.
c) Give the role of phosphorus as an essential plant nutrient. (2+2+2)
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