



IV Semester B.Sc. Examination, May 2017  
(CBCS) (2015 – 16 and Onwards)  
(Fresh + Repeaters)  
CHEMISTRY – IV

Time : 3 Hours

Max. Marks : 70

**Instruction :** The question paper has **two** Parts. Answer **both** Parts. Write equations, **wherever** necessary.

## PART – A

Answer **any eight** of the following questions. **Each** question carries **two** marks.

(8×2=16)

1. Explain the principle involved in the desilverisation of lead by Pattinson's method.
2. How many components are present in
  - i) S (Rhombic)  $\longrightarrow$  S (Monoclinic)
  - ii)  $\text{CaCO}_3$  (S)  $\longrightarrow$  CaO (S) +  $\text{CO}_2$  (g) ?
3. Give any two applications of liquid crystals.
4. Name any two chemical and biological impurities present in water.
5. Complete the following nuclear reactions
  - i)  ${}_{94}^{239}\text{Pu} + {}_2^4\text{He} \longrightarrow {}_{96}^{242}\text{Cm} + \dots$
  - ii)  ${}_{27}^{59}\text{Co} + {}_1^2\text{H} \longrightarrow {}_{27}^{60}\text{Co} + \dots$
6. State group displacement law.
7. What are alloy steels ? Give an example.
8. Explain Rosenmund's reduction reaction with an example.



9. Explain Perkin condensation with an example.
10. p-nitrobenzoic acid is stronger than benzoic acid why ?
11. Explain Keto-enol tautomerism with an example.
12. What are the harmful effects of acid rain ?

## PART - B

Answer any nine of the following questions. Each question carries six marks.

(9x6=54)

13. a) Draw a labelled phase diagram for water system indicate the triple points and curves.  
b) State phase rule. Mention the terms involved. (4+2)
14. a) Derive Bragg's equation  $n\lambda = 2d\sin\theta$ .  
b) Sketch the unit cell of Caesium chloride and indicate the Caesium ions. (4+2)
15. a) Define the following terms :
  - i) Axis of symmetry
  - ii) Plane of symmetry
  - iii) Centre of symmetry.b) What are high temperature super conductors ? Give an example. (3+3)
16. a) Explain the process of demineralisation of water by reverse Osmosis method.  
b) What is powder metallurgy ? Mention its advantages. (4+2)
17. a) Write a neat diagram of a nuclear reactor and mention the role of control rods and moderators.  
b) What is C<sup>14</sup> dating ? (4+2)





18. a) Mention the applications of radioactive isotopes in the field of  
i) Agriculture  
ii) Medicine
- b) Calculate the half life of a radioactive element whose decay constant is  $1.64 \times 10^{-2} \text{ year}^{-1}$ . (4+2)
19. a) Describe the production of tungsten powder from wolframite.  
b) What is the action of heat on oxalic acid ? Write equation. (4+2)
20. a) Write a note on the following :  
i) Ferrite  
ii) Cementite
- b) What are the advantages of heat treatment of steel ? (4+2)
21. a) Explain the mechanism of aldol condensation.  
b) How are ketones prepared from nitriles ? (4+2)
22. a) Discuss the effect of substituents on the acidity of aliphatic carboxylic acids.  
b) How does acetyl chloride react with ammonia ? Give equation. (4+2)
23. a) Explain the mechanism of benzoin condensation.  
b) What is Mannich reaction ? Give an example. (4+2)
24. a) How are the following conversions effected ?  
i) ethylaceto acetate into butanone.  
ii) diethylmalonate into cinnamic acid.
- b) How is ethyl aceto acetate prepared ? (4+2)
25. a) Describe the different stages of sewage treatment.  
b) What are the consequences of green house effect ? (4+2)
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