



NS – 291

III Semester B.Sc. Examination, November/December 2016
(CBCS) (2015 – 16 and Onwards) (F + R)
CHEMISTRY – III

Time : 3 Hours

Max. Marks : 70

- Instructions :** 1) The question paper has *two* Parts.
2) Draw diagrams and write chemical equations *wherever* necessary.

PART – A

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

(8×2=16)

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1. Define the term : "temperature coefficient of a reaction".
2. State third law of thermodynamics.
3. What are spontaneous and non spontaneous processes ?
4. Define half life period of a reaction.
5. How is Teflon prepared ?
6. What is an adsorption isotherm ?
7. Why P-methyl phenol is less acidic than phenol ?
8. What are Ellingham diagrams ?
9. Explain esterification reaction with an example.
10. Write the structure and uses of 1, 3-dithiane.
11. What are epoxides ? Give an example.
12. Name any two fertilizer industries in India.

P.T.O.



PART – B

Answer **any nine** of the following questions. **Each** question carries **six** marks. **(9×6=54)**

13. a) Derive an expression for rate constant of a second order reaction, when $a = b$.
b) How is the order of a reaction is determined by the Ostwald's isolation method ?
(4+2)
14. a) Derive the relation between C_p and C_r .
b) Calculate the thermodynamic efficiency of a steam engine working between temperatures 393K and 298K.
(4+2)
15. a) Explain the types of polymerisation with suitable examples.
b) The rate constants for a reaction at 300K and 320K are 2.5×10^{-5} and $5.0 \times 10^{-5} \text{ s}^{-1}$ respectively. Calculate the energy of activation (Given $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$).
(4+2)
16. a) Derive Van't Hoff's reaction isotherm.
b) Aluminium is preferred to carbon in the reduction of chromium oxide. Why ?
(4+2)
17. a) Describe the extraction of uranium from pitch blende.
b) Name two important ores and give their chemical composition of Nickel.
(4+2)
18. a) Explain how alcohols are distinguished by Lucas test.
b) What is the action of Lead acetate on the oxidation of glycol ? Give the equation.
(4+2)
19. a) Derive Gibbs Helmholtz equation.
b) Write a note Nernst heat theorem.
(4+2)
20. a) Write the reactions involved in the synthesis of glycerol from propene.
b) How is ethylmercaptan prepared from ethylalcohol ?
(4+2)



21. a) Explain the mechanism of Reimer-Tiemann reaction.
b) How is Phenol converted to methyl salicylate ? (4+2)
22. a) How are ethers prepared from :
i) alcohol
ii) primary alkylhalide.
b) How is acetaldehyde synthesised from methyl magnesium iodide ? (4+2)
23. a) Describe the manufacture of urea and give its uses.
b) Give any two functions of phosphorus as an essential nutrient in a fertilizer. (4+2)
24. a) What is heterogenous catalysis ? Explain the adsorption theory of heterogeneous catalysis.
b) Write B.E.T. equation and indicate the terms involved. (4+2)
25. a) Describe manufacture of bleaching powder.
b) How is lithium dialkyl cuprite prepared ? (4+2)
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