BVN

Name _____ Class & Section _____ Roll No. _____

FIRST TERMINAL EXAMINATION-2014-2015

Class-XII

Subject-Chemistry

Time Allowed : 3 Hrs. **M.M. : 70**

Please Check the Total Marks

Do not write any answers on the questions paper. Check the total marks.

INSTRUCTIONS :

(i) *All questions are compulsory*

(ii) *Marks for each question are indicated against it.*

(iii) *Q.No. 1 to 5 are very short answer questions and carry 1 mark each.*

(iv) *Q. No, 6 to 10 are short answer questions and carry 2 marks each.*

(v) *Q. No. 11 to 22 are also short answer questions and carry 3 marks each.*

(vi) *Q. No. 23 is value Based Question and carries 4 marks.*

(vii) *Q. No. 24 to 26 are long answer questions and carry 5 marks each.*

(viii) *Use log Tables, if necessary. Use of calculator is not allowed.*

1. Why do ionic crystals have high melting points ? (1)

2. 18 g of glucose (m. mass 180gmol^{-1}) is dissolved in 1 kg of water in a sauce pan. At what temperature will this solution boil ? (kb for H_2O = 0.52K kg mol^{-1}) (1)

3. Can tin coating on iron act as sacrificial anode in protecting iron against corrosion? $E^\circ_{Fe^{+2}/Fe}$ = –0.44v , $E^\circ sn^{+2}/sn$ = –0.14V) (1)

4. Plot a graph for the calculation of Activation energy by Arrhenius equation. (1)

5. Give IUPAC name of the following compound

$$(CH_3)_3 - C - \underset{\underset{O}{\|}}{C} - \underset{\underset{O}{\|}}{C} - OH$$

6. (i) What kind of defect is produced, when AgCl is doped with $CdCl_2$.

(ii) What kind of Semiconductor is obtained when silicon is doped with Boron, justify. (2)

7. A reaction is of Second order with respect to A and of first order with respect to B

$$A + B \rightarrow \text{Product}$$

(a) How is the rate affected when the concentration of A is increased by 3 times. (2)

(b) How is the rate affacted when concentration of both A and B is doubled.

8. Write down the mechanism of the reaction between ethanol and excess HI at higher temperature. (2)

9. Arrange the following : (2)

(i) In decreasing order of the Pkb value –

$C_2H_5NH_2$, $C_6H_5NHCH_3$, $(C_2H_5)_2NH$ and $C_6H_5NH_2$

(ii) 4- Methoxy benzoic acid, Benzoic acid, 4-Nitro benzoic acid – in decreasing ka value.

OR

(i) In increasing order of basic strength-Aniline, P-nitroaniline and p-toluidine

(ii) Increasing order of boiling points–

$CH_3–CH_2–CH_2–CHO$, $CH_3–CH_2–CH_2–CH_2OH$, $C_2H_5–O–C_2H_5$,

$CH_3–CH_2–CH_2–CH_2–CH_3$

10 (a) What are anionic detergents ? Give one example. (2)

(b) What is the composition of dettol ?

11. Niobium crystallizes in body centered cubic structure. If its density is $8.55 gcm^{-3}$, calculate atomic radius of niobium, given that its atomic mass 93 u. (3)

12. Henry's Law cnstant for CO_2 in water is 1.67×10^8pa at 298 k. Calculate the quantity of CO_2 in 500 ml of soda water when packed under 2.5 atm CO_2 pressure at 298 k. (3)

13. (i) What would be the value of van't Hoff Factor, for a dilute solution of Glauber's salt ($Na_2SO_4 . 10H_20$)

(ii) What is a Hypotonic solution.

(ii) Write down the principle of Reverse Osmosis

14. (i) Define fuel cells (3)

(ii) Write down the mechanism of Rusting.

15. Write the Nernst equation and calculate the emf of the following cell at 298K.

$$Pt, H_{2(g)} \mid bar \mid H^+(.030M) \mid \mid Br^-(.010M) \mid Br_{2(l)}, pt_{(s)}$$
$$(s)$$

$$E^\circ_{Br_2|2Br^-} = 1.09V \quad \log 3 = 0.4771$$

16. The following, data was obtained for the reaction– (3)

$$2NO(g) + Br_2(g) \rightarrow 2NO(g)$$

	Initial Concentration		Initial Rate
Experiment	[No]	Br_2]	mol L^{-1} min^{-1}
1.	0.10	0.10	1.3×10^{-6}
2.	0.20	0.10	5.2×10^{-6}
3.	0.20	0.30	1.56×10^{-5}

Determine– (i) the orders with respect to NO & Br_2 (3)

(ii) the Rate law and

(iii) the Rate Constant

17. Give Chemical reactions to show–

(i) Straight chain structure of glucose

(ii) presence of 5 – OH groups in glucose

(iii) Presence of $>C = 0$ group in glucose (3)

18. Give equations for the preparation of the following polymers.

(i) a polyamide fibre

(ii) A synthetic rubber (3)

(iii) a Thermosetting polymer

19. Give plausible reasons for the following observations–

(i) Phenoxide ion has more resonating structures than carboxylate ion still the latter is more acidic

(ii) Nitration of aniline gives m-nitroaniline in substantial amount.

(iii) There are two amino groups in semicarbazide however only one is involved in the formation of Semicarbazone. (3)

OR

(i) Benzylic halides show high reactivity towards SN^1 reaction

(ii) Amino group is protected to obtain monobromoaniline.

(iii) Aldehydes are more prone to nucleophilic addition reactions than ketones.

20. How will you carry out the following conversions :—

(i) Acetic acid to acetophenone

(ii) Ethanol to 3-Hydroxybutanal

(iii) Benzamide to toluene (3)

21. (i) Arrange the following polymers in increasing order of their intermolecular forces :–

Nylon 6, Neoprene, Polyvinyl chloride

(ii) Name one biodegradable polymer & name its components. (3)

(iii) Write down the equation for the preparation of Dacron.

22. An optically active compound 'A' having molecular formula $C_5H_{11}NO$, on acid hydrolysis, gives compound B and NH_3 is released. When A is treated with Bromine and an alkali, compound C is obtained which on treatments with HNO_2 gives an optically active compound D and N_2gas.

Compound D gives positive Iodoform test. Deduce the structures of ABCD and give relevant equations. (3)

23. Manik went to doctor for the treatment of his nephew. Nurse was asked to give him penicillin injection. Manik stopped her, as she was administering pencillin without testing its reaction on the patient.

(i) What are the values associated with Manik's behaviour.

(ii) Name a synthetic modification of pencillin.

(iii) What are narrow spectrum antibiotics ?

(iv) Name two broad spectrum antibiotics and mention two diseases, against which they can be used. (4)

24. (i) Write one structural difference between–

(a) Amylose and amylopectin

(b) RNA and DNA

(c) Nucleotide and Nucleoside

(ii) Write short notes on–

(a) Denaturation of protein

(b) Inversion of Sugar. (5)

OR

(i) Give two points in support of cyclic structure of glucose

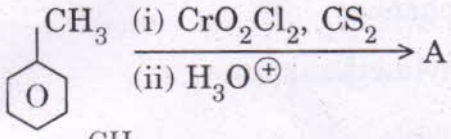
(ii) What are anomers ?

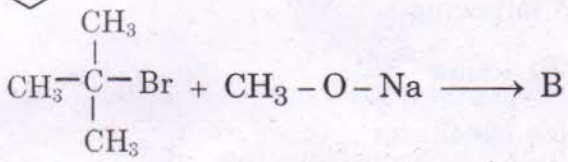
(iii) Name one essential and one non-essential amino acid.

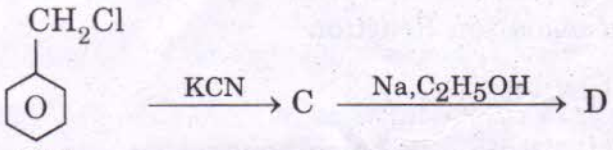
(iv) What is the structural difference between starch and cellulose

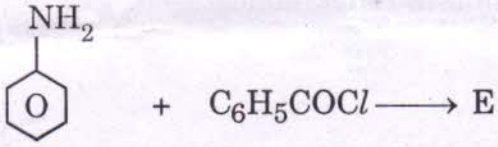
(v) Give one dificiency disease and one source of vitamin D

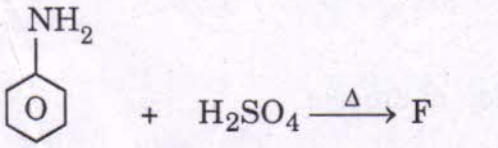
25. (a) Complete the following blanks–

(i) 

(ii) 

(iii) 

(iv) 

(v) 

(b) How will distinguish between the given pairs (5)

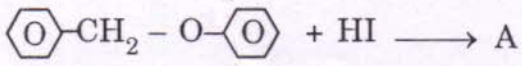
Give suitable tests :–

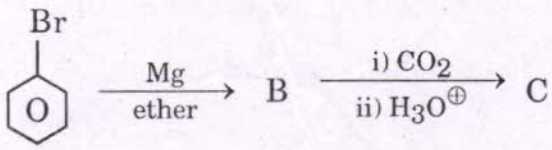
(i) Methanoic acid and Ethanoic acid

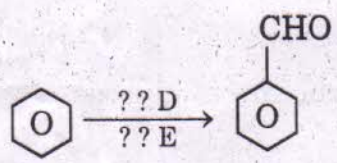
(ii) N–methylmethanamine and N, N Dimethyl methanamine

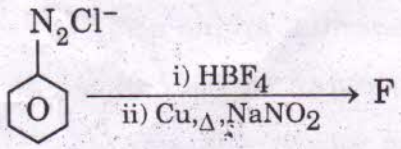
OR

Complete the following–

(i) 

(ii) 

(iii) 

(iv) 

(b) Distinguish between the given pairs by giving suitable tests :–

(i) Acetophenone and benzophenone

(ii) Methylamine and N-Methylmethanamine

26. Write short notes on the following : (5)

(i) Reimer Tiemann Reaction

(ii) Gabriel phthalimide synthesis

(iii) Hydroboration oxidation Reaction

(iv) Finkelstein Reaction

(v) Nucleophilic substitution in haloalkanes

OR

(i) Kolbe's Reacton

(ii) Coupling Reaction

(iii) Friedel crafts alkytation of anisole.

(iv) Gattermann Reaction

(v) Nucleophilic addition in aldehydes or Ketones (5)