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CLASSROOM CONTACT PROGRAMME

(ACADEMIC SESSION 2023-2024)

Class – XII - NEET – 2023

Test Type: Chapter wise Test **Date: 06/10/2023**

CHEMISTRY
Instructions

*Duration of test 60 min and questions Paper contains 50 questions. The maximum marks are 180. Section –A contains 35 Questions Section B contains 15 questions. Please ensure that the Questions paper you have received contains **ALL THE QUESTIONS** in each Part.*

CHEMISTRY

SECTION – A

1. For a reaction R → P, the concentration of a reactant changes from 0.05 M to 0.04 M in 30 minutes. What will be the average rate of reaction in minutes?
(a) $4\times10^{-4}\,M\,min^{-1}$ (b) $8\times10^{-4}\,M\,min^{-1}$
(c) $3.3\times10^{-4}\,M\,min^{-1}$ (d) $2.2\times10^{-4}\,M\,min^{-1}$

2. For the reaction, $2N_2O_5 \longrightarrow 4NO_2 + O_2$, the rate of reaction can be expressed in terms of time and concentration by the expression:
(a) $\text{Rate} = -\frac{d[N_2O_5]}{dt} = -\frac{1}{4}\frac{d[NO_2]}{dt} = \frac{1}{2}\frac{d[O_2]}{dt}$
(b) $\text{Rate} = -\frac{1}{2}\frac{d[N_2O_5]}{dt} = \frac{1}{4}\frac{d[NO_2]}{dt} = \frac{d[O_2]}{dt}$
(c) $\text{Rate} = -\frac{1}{4}\frac{d[N_2O_5]}{dt} = \frac{1}{2}\frac{d[NO_2]}{dt} = \frac{d[O_2]}{dt}$
(d) $\text{Rate} = -\frac{1}{2}\frac{d[N_2O_5]}{dt} = \frac{1}{2}\frac{d[NO_2]}{dt} = \frac{1}{2}\frac{d[O_2]}{dt}$

3. The rate of disappearance of SO_2 in the reaction, $2SO_2 + O_2 \rightarrow 2SO_3$ is 1.28×10^{-5} mol s^{-1}. The rate of appearance of SO_3 is
(a) 0.64×10^{-5} mol s^{-1} (b) 0.32×10^{-5} mol s^{-1}
(c) 2.56×10^{-5} mol s^{-1} (d) 1.28×10^{-5} mol s^{-1}

4. For the reaction $2NH_3 \rightarrow N_2 + 3H_2$, if $-\frac{d[NH_3]}{dt} = k_1[NH_3], \frac{d[N_2]}{dt} = k_2[NH_3], \frac{d[H_2]}{dt} = k_3[NH_3]$
then the relation between k_1, k_2 and k_3 is
(a) $k_1 = k_2 = k_3$ (b) $k_1 = 3k_2 = 2k_3$
(c) $1.5k_1 = 3k_2 = k_3$ (d) $2k_1 = k_2 = 3k_3$

5. Rate constant of two reactions are given below. Identifying their order of reaction.
(i) $k = 5.3 \times 10^{-2}$ L mol^{-1} s^{-1}
(ii) $k = 3.8 \times 10^{-4}$ s^{-1}
(a) (i) second order, (ii) first order
(b) (i) first order, (ii) second order
(c) (i) zero order, (ii) first order
(d) (i) second order, (ii) zero order

6. A reaction in which reactants (R) are converted into products (P) follows second order kinetics. If concentration of R is increased by four times, what will be the increase in the rate of formation of P?
(a) 9 times (b) 4 times
(c) 16 times (d) 8 times

7. The unit of rate constant for the reaction,
$2H_2 + 2NO \rightarrow 2H_2O + N_2$
which has rate = $k[H_2]\,[NO]^2$, is
(a) mol L^{-1} s^{-1} (b) s^{-1}
(c) mol^{-2} L^2 s^{-1} (d) mol L^{-1}

8. For a reaction, $2NO + 2H_2 \rightarrow N_2 + 2H_2O$, the possible mechanism is

$2NO \rightleftharpoons N_2O_2$

$N_2O_2 \xrightarrow{slow} N_2O + H_2O$

$N_2O + H_2O \xrightarrow{fast} N_2 + H_2O$

What is the rate law and order of the reaction?

(a) Rate = $[N_2O_2]$, order = 1
(b) Rate = $[N_2O_2]$ $[H_2]$, order = 2
(c) Rate = $[N_2O_2]^2$, order = 2
(d) Rate = $[N_2O_2]^2$ $[H_2]$, order = 3

9. The rate constant of a reaction depends upon

(a) temperature of the reaction
(b) extent of the reaction
(c) initial concentration of the reactants
(d) the time of completion of reaction

10. Which of the following statements for order of reaction is not correct?

(a) Order can be determined experimentally.
(b) Order of reaction is equal to the sum of powers of concentration terms in rate law expression.
(c) Order cannot be fractional
(d) Order is not affected by stoichiometric coefficient of the reactants.

11. For a reaction, $I^- + OCl^- \rightarrow IO^- + Cl^-$ in an aqueous medium, the rate of reaction is given by $\frac{d[IO^-]}{dt} = k\frac{[I^-][OCl^-]}{[OH^-]}$. The overall order of reaction is

(a) -1 (b) 0 (c) 1 (d) 2

12. Half- life period of a first order reaction is 10 min. What percentage of the reaction will be completed in 100 min?

(a) 25% (b) 50% (c) 99.9% (d) 75%

13. In pseudo unimolecular reactions,

(a) both the reactants are present in low concentration
(b) both the reactants are present in same concentration
(c) one of the reactant is present in excess
(d) one of the reactant is non- reactive

14. The hydrolysis of ethyl acetate,

$CH_3COOC_2H_5 + H_2O \xrightarrow{H^+} CH_3COOH + C_2H_5OH$

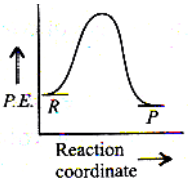
is a reaction of

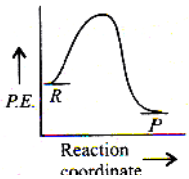
(a) zero order (b) pseudo first order
(c) second order (d) third order

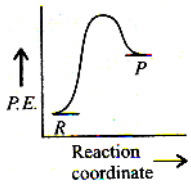
15. The activation energy in a chemical reaction is defined as

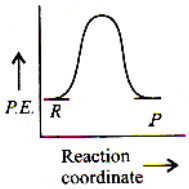
(a) the difference in energies of reactants and products
(b) the sum of energies of reactants and products
(c) the difference in energy of intermediate complex with the average energy of reactants and products
(d) the difference in energy of intermediate complex and the average energy of reactants

16. An endothermic reaction with high activation energy for the forward reaction can be shown by the figure

(a) 

(b) 

(c) 

(d) 

17. The minus sign in rate = $-\frac{d[A]}{dt}$ indicates the _____ in concentration of the _____ with time. The rate of a reaction is always _____ quantity. The rate of reaction increase with ____ in concentration of reactants. The blanks in the question corresponds to

(a) decrease, products, positive, increase
(b) increase, reactants, negative, decrease
(c) decrease, reactants, positive, increase
(d) increase, products, positive, increase

18. Match the column I and column II and mark the appropriate choice.

Column – I		Column - II	
(A)	CH_3CHCl_2	(i)	Vinyl halide
(B)	CH_2ClCH_2Cl	(ii)	Alkylidene halide
(C)	$CHCl = CH_2$	(iii)	Alkylene dihalide
(D)	$ClCH_2 - CH = CH_2$	(iv)	Allyl halide

(a) (A) → (i), (B) → (ii), (C) → (iv), (D) → (iii)
(b) (A) → (ii), (B) → (iii), (C) → (i), (D) → (iv)
(c) (A) → (iii), (B) → (iv), (C) → (ii), (D) → (i)
(d) (A) → (iv), (B) → (i), (C) → (iii), (D) → (ii)

19. Which of the following compounds can yield only one monochlorinated product upon free radical chlorination?

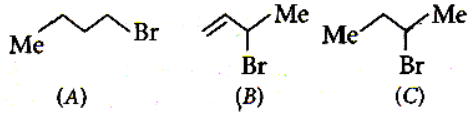
(a) 2, 2-Dimethylpropane (b) 2-Methylpropane
(c) 2-Methylbutane (d) *n*-Butane

20. Which of the following compounds has the highest boiling point?

(a) $CH_3CH_2CH_2Cl$ (b) $CH_3CH_2CH_2CH_2Cl$
(c) $CH_3CH(CH_3)CH_2Cl$ (d) $(CH_3)_3CCl$

21. Ethyl alcohol is obtained when ethyl chloride is boiled with
(a) alcoholic KOH (b) aqueous KOH
(c) water (d) aqueous $KMnO_4$

22. Consider the following bromides :

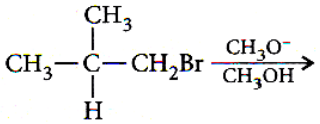


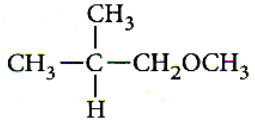
The correct order of $S_N1$reactivity is
(a) A > B > C (b) B > C > A
(c) B > A > C (d) C > B > A

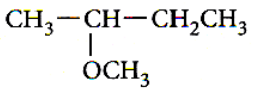
23. The order of reactivity of various alkyl halides towards nucleophilic substitution follows the order
(a) R – I > R – Br > R – Cl > R - F
(b) R – F > R – Cl > R – Br > R – I
(c) R – Cl > R – Br > R – I > R – F
(d) R – Br > R – I > R – Cl > R – F

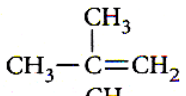
24. Identify the products (A) and (B) in the reactions.
$RX + AgCN \longrightarrow \underline{(A)} + AgX;$
$RX + KCN \longrightarrow \underline{(B)} + KX$
(a) (A) → *R*CN, (B) → *R*CN
(b) (A) → *R*CN, (B) → *R*NC
(c) (A) → *R*NC, (B) → *R*CN
(d) (A) → *R*NC, (B) → *R*NC

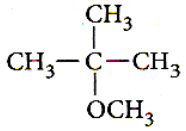
25. The major product formed in the following reaction is



(a) 

(b) 

(c) 

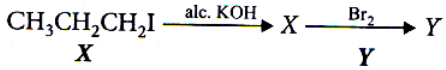
(d) 

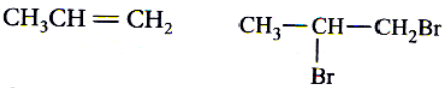
26. Grignard reagent, a very useful starting compound for a number of organic reactions can be prepared by
(a) reaction of alkyl halides with a solution of magnesium hydroxide
(b) reaction of alkyl halides with dry magnesium powder in presence of dry ether
(c) reaction of $MgCl_2$ with ether and alcohol
(d) reaction of alkyl halide with magnesium in presence of alcohol.

27. Which of the following statements regarding the S_N1 reaction shown by alkyl halide is not correct?
(a) The added nucleophile plays no kinetic role in S_N1 reaction
(b) The S_N1 reaction involves the inversion of configuration of the optically active substrate.
(c) The S_N1 reaction on the chiral starting material ends up with racemization of the product.
(d) The more stable the carbocation intermediate the faster the S_N1 reaction

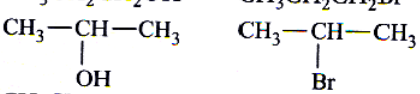
28. Methyl bromide reacts with AgF to give methyl fluoride and silver bromide. This reaction is called
(a) Fitting reaction (b) Swarts reaction
(c) Wurtz reaction (d) Finkelstein reaction

29. Consider the following reaction and identify X and Y.



(a) 

(b) 

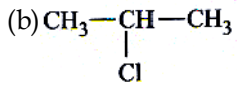
(c) 

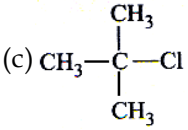
(d) 

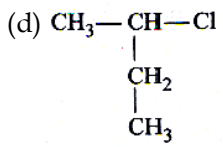
30. A mixture of two haloalkanes was treated with sodium metal in ether solution. After the reaction, the product formed was 2-methylpropane. The two haloalkanes present in the mixture were
(a) 2-chloropropane and chloromethane
(b) chloropropane and chloroethane
(c) 2-chloropropane and chloroethane
(d) chloroethane and chloromethane

31. In S_N2 reactions the sequence of bond breaking and bond formation is as follows
(a) bond breaking is followed by formation
(b) bond formation is followed by breaking
(c) bond breaking and formation are simultaneously
(d) bond breaking and formation take place randomly.

32. Grignard reagents are formed by the reaction of alkyl halides by warming
(a) with alcoholic solution
(b) with $MgCl_2$
(c) Mg in presence of dry ether
(d) with $MgCO_3$

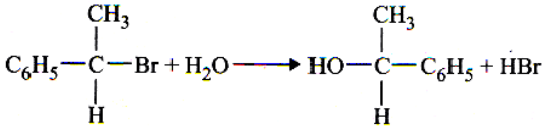
33. S_N1 reaction is fastest in
(a) CH_3CH_2Br (b) 

(c) 

(d) 

34. Which of the following is most reactive towards aqueous NaOH?
(a) C_6H_5Cl (b) $C_6H_5CH_2Cl$
(c) C_6H_5Br (d) BrC_6H_4Br

35. Consider the following reaction :



The reaction proceeds with 98% racemisation. The reaction may follow
(a) S_N1 mechanism (b) S_N2 mechanism
(c) E1 mechanism (d) E2 mechanism

SECTION – B

36. Nitrogen shows different oxidation states ranging from
(a) –3 to +5 (b) –5 to +5
(c) 0 to –5 (d) –3 to +3

37. The decreasing order of boiling points of the following hybrides is
(a) $H_2O > SbH_3 > AsH_3 > PH_3 > NH_3$
(b) $H_2O > NH_3 > SbH_3 > AsH_3 > PH_3$
(c) $H_2O > SbH_3 > NH_3 > AsH_3 > PH_3$
(d) $H_2O > PH_3 > AsH_3 > SbH_3 > NH_3$

38. Which of the following shows nitrogen in its increasing order of oxidation number?
(a) $N_2O < NO < NO_2 < NO_3^- < NH_4^+$
(b) $NH_4^+ < N_2O < NO < NO_2 < NO_3^-$
(c) $NH_4^+ < N_2O < NO_2 < NO_3^- < NO$
(d) $NH_4^+ < NO < N_2O < NO_2 < NO_3^-$

39. Nitrogen forms stable N_2 molecule but phosphorus is converted to P_4 from P_2 because
(a) $p\pi - p\pi$ bonding is strong in phosphorus
(b) $p\pi - p\pi$ bonding is weak in phosphorus
(c) triple bond is present in phosphorus
(d) single P – P bond is weaker than N – N bond

40. Ammonia is used in detection of Cu^{2+} ion because
(a) aqueous solution of NH_3 reacts with Cu^{2+} ion to form deep blue coloured complex
(b) NH_3 reacts with Cu^{2+} ion to give blue precipitate of CuO
(c) aqueous solution of NH_3 reacts with Cu^{2+} ion to form white colured complex
(d) NH_3 reacts with Cu^{3+} ion to give green precipitate.

41. Phosphorous acid on heating gives the following products:
$4H_3PO_3 \xrightarrow{\Delta} 3H_3PO_4 + PH_3$
The above reaction is an example of
(a) oxidation
(b) thermal decomposition
(c) disproportionation
(d) reduction

42. Arrange the following hybrids of group 16 elements in order of increasing stability.
(a) $H_2S < H_2O < H_2Te > H_2Se$
(b) $H_2O < H_2Te < H_2Se < H_2S$
(c) $H_2O < H_2S < H_2Se < H_2Te$
(d) $H_2Te < H_2Se < H_2S < H_2O$

43. Which of the following is not correctly matched?
(a) Acidic oxides – P_2O_5, NO_2, Cl_2O_7
(b) Basic oxides – Na_2O, CaO, MgO
(c) Neutral oxides – CO_2, CO, BeO
(d) Amphoteric oxides – ZnO SnO, Al_2O_3

44. Which of the following is the wrong statement?
(a) Ozone is paramagnetic gas
(b) ONCI and ONO^- are not isoelectronic
(c) O_3 molecule is bent
(d) Ozone is violet-black in solid state

45. Sulphur molecule is
(a) diatomic (b) triatomic
(c) tetratomic (d) octa-atomic

46. On heating $KClO_3$ we get
(a) $KClO_2 + O_2$ (b) $KCl + O_2$
(c) $KCl + O_3$ (d) $KCl + O_2 + O_3$

47. Which of the following oxides is anhydride of nitrous acid?
(a) N_2O_3 (b) NO_2 (c) NO (d) N_2O_4

48. PCl_3 on hydrolysis gives
(a) H_3PO_3 (b) HPO_3 (c) H_3PO_4 (d) $POCl_3$

49. Arrange the following in decreasing Lewis acid strength –PF_3, PCl_3, PBr_3, PI_3.
(a) $PI_3 > PBr_3 > PCl_3 > PF_3$
(b) $PF_3 > PCl_3 > PBr_3 > PI_3$
(c) $PCl_3 > PBr_3 > PI_3 > PF_3$
(d) $PBr_3 > PI_3 > PF_3 > PCl_3$

50. Which of the following is not correctly matched?
(a) PCl_5 – sp^3d hybridisation
(b) PCl_3 – sp^3 hybridisation
(c) PCl_5 (solid) – $[PtCl_4]^+ [PtCl_6]^-$
(d) H_3PO_3 - tribasic