



I. Choose the correct answer

[15 × 1 = 15]

- A zero order reaction $X \rightarrow \text{Product}$, with an initial concentration 0.02M has a half life of 10 min. if one starts with concentration 0.04M, then the half life is
a) 10 s b) 5 min c) 20 min d) cannot be predicted using the given information
- The addition of a catalyst during a chemical reaction alters which of the following quantities?
a) Enthalpy b) Activation energy c) Entropy d) Internal energy
- For a first order reaction, the rate constant is 6.909 min^{-1} . the time taken for 75% conversion in minutes is
a) $\left(\frac{3}{2}\right) \log 2$ b) $\left(\frac{2}{3}\right) \log 2$ c) $\left(\frac{3}{2}\right) \log \left(\frac{3}{4}\right)$ d) $\left(\frac{2}{3}\right) \log \left(\frac{4}{3}\right)$
- If the initial concentration of the reactant is doubled, the time for half reaction is also doubled. Then the order of the reaction is
a) Zero b) one c) Fraction d) none
- The half life period of a radioactive element is 140 days. After 560 days, 1 g of element will be reduced to
a) $\left(\frac{1}{2}\right)$ g b) $\left(\frac{1}{4}\right)$ g c) $\left(\frac{1}{8}\right)$ g d) $\left(\frac{1}{16}\right)$ g
- If 75% of a first order reaction was completed in 60 minutes, 50% of the same reaction under the same conditions would be completed in
a) 20 minutes b) 30 minutes c) 35 minutes d) 75 minutes
- After 2 hours, a radioactive substance becomes $\left(\frac{1}{16}\right)^{th}$ of original amount. Then the half life (in min) is
a) 60 minutes b) 120 minutes c) 30 minutes d) 15 minutes
- The formation of cyanohydrin from acetone is an example of
a) nucleophilic substitution b) electrophilic substitution
c) electrophilic addition d) Nucleophilic addition
- In the following reaction,
$$\text{HC}\equiv\text{CH} \xrightarrow[\text{HgSO}_4]{\text{H}_2\text{SO}_4} \text{X}$$
 Product 'X' will not give
a) Tollen's test b) Victor meyer test
c) Iodoform test d) Fehling solution test
- $$\text{CH}_2=\text{CH}_2 \xrightarrow[\text{ii) Zn / H}_2\text{O}]{\text{i) O}_3} \text{X} \xrightarrow{\text{NH}_3} \text{Y}$$
 'Y' is
a) Formaldehyde b) di acetone ammonia
c) hexamethylene tetraamine d) oxime
- Which one of the following reduces tollens reagent
a) formic acid b) acetic acid
c) benzophenone d) none of these

12. Benzoic acid $\xrightarrow[\text{ii) } \Delta]{\text{i) } \text{NH}_3}$ A $\xrightarrow{\text{NaOBr}}$ B $\xrightarrow{\text{NaNO}_2/\text{HCl}}$ C 'C' is
- a) anilinium chloride
b) O – nitro aniline
c) benzene diazonium chloride
d) m – nitro benzoic acid
13. Which one of the following reaction is an example of disproportionation reaction
- a) Aldol condensation
b) cannizaro reaction
c) Benzoin condensation
d) none of these
14. In which of the following reactions new carbon – carbon bond is not formed?
- a) Aldol condensation
b) Friedel craft reaction
c) Kolbe's reaction
d) Wolf kishner reduction
15. The reagent used to distinguish between acetaldehyde and benzaldehyde is
- a) Tollens reagent
b) Fehling's solution
c) 2,4 – dinitrophenyl hydrazine
d) semicarbazide

II. Answer any 5 of the following questions:

[5 × 2 = 10]

16. Define average rate and instantaneous rate.
17. Define rate law.
18. What is rate constant?
19. Write the preparation of acetaldehyde from ozonolysis.
20. Write a note on Rosenmund reduction.
21. Write a equation for stephen's reaction.
22. Write a notes on perkin's reaction.

III. Answer any 5 of the following questions:

[5 × 3 = 15]

23. What is an elementary reaction? Give the differences between order and molecularity of a reaction.
24. Define half life of a reaction. Show that for a first order reaction half life is independent of initial concentration.
25. Write Arrhenius equation and explains the terms involved.
26. Give two examples for zero order reaction.
27. Write a note on Knoevenagal reaction.
28. Write the preparation and uses of Urotropine.
29. Write a notes on Wolf Kishner reduction.

IV. Answer the following questions:

[2 × 5 = 10]

30. a) Derive integrated rate law for a zero order reaction $A \rightarrow \text{product}$.

[OR]

- b) Derive integrated rate law for a first order reaction.

31. a) Explain the mechanism of aldol concentration.

[OR]

- b) Explain the mechanism of cannizaro's reaction.