13. How will you convert benzene into :

(i) p-nitrobromobenzene (ii) m-nitrochlorobenzene

(iii) p-nitrotoluene (iv) acetophenone

Short Answer Type-II (3 Marks)

14. In the alkane $H_3CCH_2-C(CH_3)_2-CH_2CH(CH_3)_2$, identify 1°, 2°, 3° carbon atoms and give the number of H-atoms bonded to each one of these.

15. What effect does branching of an alkane chain has on its boiling point ?

16. Addition of HBr to propene yields 2-bromopropane, while in the presence of benzoyl peroxide, the same reaction yields 1-bromopropane. Explain and give mechanism.

17. Write down the products of ozonolysis of 1, 2-dimethyl benzene (o-xylene). How does the result support Kekule structure of benzene ?

18. Arrange benzene, n-hexane and ethyne in decreasing order of acidic behaviour. Also give reason for this behaviour.

19. Why does benzene undergo electrophilic substitution reactions easily and nucleophilic substitutions reactions with difficulty ?

Long Answer Type (5 Marks)

20. How would you convert the following compounds into benzene ?

(i) Ethyne (ii) Ethene (iii) Hexane

21. Arrange the following set of compounds in order of their decreasing reactivity with an electrophile, E^+

(a) Chlorobenzene, 2, 4-dinitrochlorobenzene, p-nitrochlorobenzene.

(b) Toluene, $p-H_3C-C_6H_4-NO_2, p-O_2N-C_6H_4-NO_2$.

22. Out of benzene, m-dinitrobenzene and toluene which will undergo nitration most easily and why ?

23. Suggest the name of a Lewis acid other than anhydrous aluminium chloride ($AlCl_3$) which can be used during ethylation of benzene.

24. Draw the structures of cis-and trans-isomers of the following compounds. Also write their IUPAC names.

(i) $CHCl = CHCl$ (ii) $C_2H_5C(CH_3) = C(CH_3)C_2H_5$

25. How will you convert ethanoic acid into benzene ?