CHEMISTRY

Hydrocarbons

Speed TEST 41

Chapter-wise

No. of Questions	Maximum Marks	Time
45	180	1 Hour

GENERAL INSTRUCTIONS

- This test contains 45 MCQ's. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.
- You have to evaluate your Response Grids yourself with the help of solutions provided at the end of this book.
- Each correct answer will get you 4 marks and 1 mark shall be deduced for each incorrect answer. No mark will be given/ deducted if no bubble is filled. Keep a timer in front of you and stop immediately at the end of 60 min.
- The sheet follows a particular syllabus. Do not attempt the sheet before you have completed your preparation for that syllabus.
- After completing the sheet check your answers with the solution booklet and complete the Result Grid. Finally spend time to analyse your performance and revise the areas which emerge out as weak in your evaluation.

1. When neo-pentyl bromide is subjected to Wurtz reaction, the product formed is
(a) 2,2,4,4-tetramethylhexane
(b) 2,2,4,4-tetramethylpentane
(c) 2,2,5,5-tetramethylhexane
(d) 2,2,3,3-tetramethylhexane

2. The conversion of 2, 3-dibromobutane to 2-butene with Zn and alcohol is
(a) redox reaction (b) α-elimination
(c) β-elimination (d) Both (a) and (b)

3. 1, 3-Butadiene when treated with Br_2 gives
(a) 1, 4-dibromo-2-butene (b) 1, 3-dibromo-2-butene
(c) 3, 4-dibromo-1-butene (d) 2, 3-dibromo-2-butene

4. An alkene having molecular formula C_7H_{14} was subjected to ozonolysis in the presence of zinc dust. An equimolar amount of the following two compounds was obtained
CH_3COCH_3 and $CH_3COC_2H_5$
The IUPAC name of the alkene is
(a) 3, 4-dimethyl-3-pentene (b) 3, 4-dimethyl-2-pentene
(c) 2, 3-dimethyl-3-pentene (d) 2, 3-dimethyl-2-pentene

5. Acid catalyzed hydration of alkenes except ethene leads to the formation of
(a) mixture of secondary and tertiary alcohols
(b) mixture of primary and secondary alcohols
(c) secondary or tertiary alcohol
(d) primary alcohol

6. In a reaction

$$CH_2 = CH_2 \xrightarrow[\text{acid}]{\text{Hypochlorous}} M \xrightarrow{R} \begin{matrix} CH_2-OH \\ | \\ CH_2-OH \end{matrix}$$

Where M = molecule; R = reagent; M and R are
(a) CH_3CH_2Cl and NaOH
(b) CH_2Cl-CH_2OH and aq. $NaHCO_3$
(c) CH_3CH_2OH and HCl
(d) $CH_2=CH_2$ and heat

7. The negative part of an addendum adds on to the carbon atom joined to the least number of hydrogen atoms. This statement is called
(a) Thiele's theory (b) Peroxide effect
(c) Markownikoff's rule (d) Baeyer's strain theory

8. Match the columns

Column-I		Column-II	
A.	$CH \equiv CH + H_2 \rightarrow CH_2 = CH_2$	I.	Zn
B.	$CH_3CH_2Br \rightarrow CH_2 = CH_2$	II.	Conc. H_2SO_4
C.	$CH_2BrCH_2Br \rightarrow CH_2 = CH_2$	III.	Pd/C
D.	$CH_3CH_2OH \rightarrow CH_2 = CH_2$	IV.	Alc. KOH

(a) A – III; B – IV; C – I; D – II
(b) A – IV; B – III; C – II; D – I
(c) A – II; B – I; C – IV; D – III
(d) A – III; B – IV; C – II; D – I

RESPONSE GRID

1. ⓐ ⓑ ⓒ ⓓ 2. ⓐ ⓑ ⓒ ⓓ 3. ⓐ ⓑ ⓒ ⓓ 4. ⓐ ⓑ ⓒ ⓓ 5. ⓐ ⓑ ⓒ ⓓ
6. ⓐ ⓑ ⓒ ⓓ 7. ⓐ ⓑ ⓒ ⓓ 8. ⓐ ⓑ ⓒ ⓓ

Space for Rough Work

9. Which of the following will yield a mixture of 2-chlorobutene and 3-chlorobutene on treatment with HCl ?

(a) $CH_2=C=CH-CH_3$ (b) $H_2C=\underset{\displaystyle CH_3}{\underset{|}{C}}-CH=CH_2$

(c) $CH_2=CH-CH=CH_2$ (d) $HC\equiv C-CH=CH_2$

10. Lindlar's catalyst is

(a) Na in alcohol (b) Raney nickel

(c) $Pd/BaSO_4$ (d) $Na/liq.\ NH_3$

11. The treatment of CH_3MgX with $CH_3C\equiv C-H$ produces

(a) $CH_3-CH=CH_2$ (b) $CH_3C\equiv C-CH_3$

(c) $CH_3-HC=CH-CH_3$ (d) CH_4

12. A group which deactivates the benzene ring towards electrophilic substitution but which directs the incoming group principally to the o- and p-positions is

(a) $-NH_2$ (b) $-Cl$ (c) $-NO_2$ (d) $-C_2H_5$

13. Isopropyl alcohol is obtained by reacting which of the following alkenes with conc. H_2SO_4 and H_2O

(a) Ethylene (b) Propylene

(c) 2-methyl propene (d) Isoprene

14. In the preparation of alkanes from hydrogenation of alkenes and alkynes. Finely divided catalysts are used which of the following statement(s) is/are correct regarding these catalysts

(i) Platinum and palladium catalyse the reaction at room temperature.

(ii) Nickel catalyse the reaction at relatively higher temperature and pressure.

(iii) Platinum and palladium catalyse the reaction at higher temperature.

(a) (i) and (iii) (b) (i) and (ii)

(c) (ii) and (iii) (d) (i) only

15. Which one of the following reactions is expected to readily give a hydrocarbon product in good yields ?

(a) $RCOOK \xrightarrow[\text{oxidation}]{\text{Electrolytic}}$ (b) $RCOO^-Ag^+ \xrightarrow{Br_2}$

(c) $CH_3CH_3 \xrightarrow[h\upsilon]{Cl_2}$ (d) $(CH_3)_3CCl \xrightarrow{C_2H_5OH}$

16. Which of the following change is correct

(a) $>C=C< \xrightarrow[\text{wet } CH_3COOH]{I_2,\ CH_3COOAg} >\underset{\displaystyle OH}{\underset{|}{C}}-\underset{\displaystyle OH}{\underset{|}{C}}<$

(b) $>C=C< \xrightarrow[\text{dry } CH_3COOH]{I_2,\ CH_3COOAg} >\underset{\displaystyle OH}{\underset{|}{C}}-\underset{\displaystyle OH}{\underset{|}{C}}<$

(c) Both (a) and (b) one correct

(d) Neither (a) nor (b)

17. The products obtained via oxymercuration ($HgSO_4$ + H_2SO_4) of 1-butyne would be

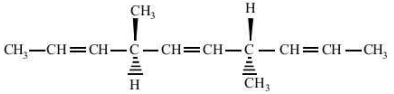
(a) $CH_3-CH_2-CO-CH_3$

(b) $CH_3-CH_2-CH_2-CHO$

(c) $CH_3-CH_2-CHO+HCHO$

(d) $CH_3CH_2COOH+HCOOH$

18. The number of optically active products obtained from the **complete** ozonolysis of the given compound is :



(a) 0 (b) 1 (c) 2 (d) 4

19. Propyne on polymerisation gives

(a) Mesitylene (b) Benzene

(c) Ethyl benzene (d) Propyl benzene

20. The electrophilic substitutions reactions of benzene takes place via

(i) generation of electrophile

(ii) generation of nucleophile

(iii) formation of carbocation intermediate

(iv) removal of proton from the carbocation intermediate

(a) (i), (iii) and (iv) (b) (ii), (iii) and (iv)

(c) (i) and (iv) (d) (ii) and (iv)

21. Two organic compounds A and B both containing only carbon and hydrogen, on quantitative analysis gave the same percentage composition by weight :

$C=(12/13)\times 100\%$, $H=(1/13)\times 100\%$

A decolourises bromine water but B does not. A and B respectively are

(a) C_2H_2 and C_6H_6 (b) C_6H_6 and C_2H_2

(c) C_2H_4 and C_2H_6 (d) C_2H_2 and C_2H_6

22. The major product of the following reaction

$H_3C-C\equiv CH \xrightarrow[\text{ether}]{CH_3CH_2MgCl}$  $\xrightarrow[H_3O^+]{}$

(a) 

(b) 

(c) 

(d) 

RESPONSE GRID					
	9. (a)(b)(c)(d)	10. (a)(b)(c)(d)	11. (a)(b)(c)(d)	12. (a)(b)(c)(d)	13. (a)(b)(c)(d)
	14. (a)(b)(c)(d)	15. (a)(b)(c)(d)	16. (a)(b)(c)(d)	17. (a)(b)(c)(d)	18. (a)(b)(c)(d)
	19. (a)(b)(c)(d)	20. (a)(b)(c)(d)	21. (a)(b)(c)(d)	22. (a)(b)(c)(d)	

Space for Rough Work

23. 2,3-Dimethyl-2-butene can be prepared by heating which of the following compounds with a strong acid ?

(a) $(CH_3)_2CH-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH=CH_2$

(b) $(CH_3)_3C-CH=CH_2$

(c) $(CH_3)_2C=CH-CH_2-CH_3$

(d) $(CH_3)_2CH-CH_2-CH=CH_2$

24. Which C-atom is the most electronegative in this structure?

$$\overset{III}{CH_3}-\overset{II}{CH_2}-\overset{I}{C}\equiv CH$$

(a) I

(b) II

(c) III

(d) all are equal electronegative

25. Which of the following will have least hindered rotation around carbon - carbon bond ?

(a) Ethane (b) Ethylene

(c) Acetylene (d) Hexachloroethane

26. Match the columns

Column - I	Column - II
A. Alkyl + Acid halide in presence of dry ether	I. Sulphonation
B. Arene + Acid halide in presence of $AlCl_3$	II. Wurtz reaction
C. Arene + Fuming sulphuric in presence of $AlCl_3$	III. Catalytic hydrogenation
D. Arene + Hydrogen in presence of Ni	IV. Friedel-Crafts reaction

(a) A – I; B – III; C – II; D – IV

(b) A – IV; B – II; C – III; D – I

(c) A – III; B – I; C – IV; D – II

(d) A – II; B – IV; C – I; D – III

27. Of the three isomeric C_3H_4 hydrocarbons shown below how many can exist with all carbon and hydrogen nuclei located in a single plane

$$H_2C=C=CH_2,\ \begin{array}{l}CH\\ \|\\ CH\end{array}\!\!>CH_2,\ H_3C-C\equiv CH$$

(a) 0 (b) 1 (c) 2 (d) 3

28. Excess of CH_3COOH is reacted with $CH\equiv CH$ in presence of Hg^{2+}, the product is

(a) $CH_3CH(OCOCH_3)_2$

(b) $CH_2=CH(OCOCH_3)$

(c) $(CH_3COO)CH_2-CH_2(OOCCH_3)$

(d) None of these

29. Which one of the following contain isopropyl group?

(a) 2, 2, 3, 3-tetramethylpentane

(b) 2, 4-dimethylhexone

(c) 2, 2, 3-trimethylpentane

(d) 3, 3-dimethylpentane

30. 1- Pentyne $\xrightarrow[BF_3,\ THF,\ H_2O_2,\ OH^-]{HgSO_4\ /\ H_2SO_4}$ X / Y

X and Y can be distinguished by

(a) Silver-mirror test (b) Iodoform test

(c) Both (d) None

31. The major product obtained in the photo catalysed bromination of 2-methylbutane is:

(a) 1-bromo-2-methylbutane

(b) 1-bromo-3-methylbutane

(c) 2-bromo-3-methylbutane

(d) 2-bromo-2-methylbutane

32. Acetylenic hydrogens are acidic because

(a) Sigma electron density of C – H bond in acetylene is nearer to carbon, which has 50% *s*-character

(b) Acetylene has only open hydrogen in each carbon

(c) Acetylene contains least number of hydrogens among the possible hydrocarbons having two carbons

(d) Acetylene belongs to the class of alkynes with molecular formula, C_nH_{2n-2}.

33. Which of the following will be most easily attacked by an electrophile?

(a) C_6H_6 (b) C_6H_5Cl (c) C_6H_5OH (d) $C_6H_5CH_3$

34. Name of the following reaction is

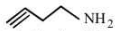
(a) Claisen Condensation (b) Diel's Alder reaction

(c) Dieckmann cyclisation (d) Michael addition reaction

35. The most suitable catalyst for the hydrogenation of 2-Hexyne $\longrightarrow$ 2-cis-Hexene is

(a) $Pd-BaSO_4$ (b) $(Ph_3P)_3RhCl$

(c) 10% Pd—C (d) Raney Ni

36.  NH_2 + Excess of Et. MgBr $\rightarrow$?

(a) 1 mole of Ethane

(b) 3 mole of ethane

(c) $EtC\equiv CCH_2CH_2NHEt$

(d) 4 mole of ethane

RESPONSE GRID					
23. ⓐⓑⓒⓓ	**24.** ⓐⓑⓒⓓ	**25.** ⓐⓑⓒⓓ	**26.** ⓐⓑⓒⓓ	**27.** ⓐⓑⓒⓓ
28. ⓐⓑⓒⓓ	**29.** ⓐⓑⓒⓓ	**30.** ⓐⓑⓒⓓ	**31.** ⓐⓑⓒⓓ	**32.** ⓐⓑⓒⓓ
33. ⓐⓑⓒⓓ	**34.** ⓐⓑⓒⓓ	**35.** ⓐⓑⓒⓓ	**36.** ⓐⓑⓒⓓ	

Space for Rough Work

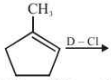
37. Among the following compounds (I – III), the correct order of reactivity with an electrophile is

$C_6H_5OCH_3$ (I) C_6H_6 (II) $C_6H_5NO_2$ (III)

(a) II > III > I (b) III < I < II

(c) I > II > III (d) I = II > III

38. What is the major product expected from the following reaction ?



Where D is an isotope of hydrogen

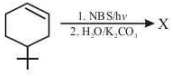
(a) 

(b) 

(c) 

(d) 

39. The product of the reaction given below is:



(a) 

(b) 

(c) 

(d) 

40. $CH_3C \equiv CCH_3 \xrightarrow[(ii)\ H_2O/Zn]{(i)\ X}$

$H_3C.C-C.CH_3$ (O, O) In the above reaction X is

(a) HNO_3 (b) O_2 (c) O_3 (d) $KMnO_4$

41. Which of the following represent the correct order of acidic strength ?

(i) $HC \equiv CH > H_2C = CH_2 > CH_3 - CH_3$

(ii) $HC \equiv CH > CH_3 - CH_3 > H_2C = CH_2$

(iii) $CH_3C \equiv CH > HC \equiv CH > CH_3 - C \equiv C - CH_3$

(iv) $HC \equiv CH > CH_3 - C \equiv CH > CH_3 - C \equiv C - CH_3$

(a) (i) and (iii) (b) (ii) and (iv)

(c) (i) and (iv) (d) (i) and (iv)

42. Which one of the following compounds would have the highest heat of hydrogenation ?

(a) $CH_2 = CH_2$

(b) $CH_3 - CH_2 - CH = CH_2$

(c) $CH_3CH = CHCH_3$

(d) $(CH_3)_2C = C(CH_3)_2$

43. On mixing a certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane. This alkane could be

(a) pentane (b) isopentane

(c) neopentane (d) propane

44. Acetylene gives

(a) white ppt with $AgNO_3$ and red ppt with Cu_2Cl_2

(b) white ppt with Cu_2Cl_2 and red ppt with $AgNO_3$

(c) white ppt with both

(d) red ppt with both

45. Sodium ethoxide is a specific reagent for

(a) dehydration (b) dehydrogenation

(c) dehydrohalogenation (d) dehalogenation

RESPONSE GRID					
	37. ⓐⓑⓒⓓ	**38.** ⓐⓑⓒⓓ	**39.** ⓐⓑⓒⓓ	**40.** ⓐⓑⓒⓓ	**41.** ⓐⓑⓒⓓ
	42. ⓐⓑⓒⓓ	**43.** ⓐⓑⓒⓓ	**44.** ⓐⓑⓒⓓ	**45.** ⓐⓑⓒⓓ	

CHEMISTRY CHAPTERWISE SPEED TEST-41			
Total Questions	45	Total Marks	180
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	37	Qualifying Score	62
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

Space for Rough Work