CHEMISTRY

BOOKS - FULL MARKS CHEMISTRY (TAMIL ENGLISH)

BASIC CONCEPTS OF ORGANIC REACTIONS

Textual Evaluation Solved Mcq

1. What is the hybridisation state of benzyl carbonium ion ?

A. sp^2

B. spd^2

C. sp^3

D. sp^2d

Answer: A

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2. Decreasing order of nucleophilicity is

A. $OH^- > NH_2^- >^- OCH_3 > RNH_2$

B. $NH_2^- > OH^- >^- OCH_3 > RNH_2$

C. $NH_2^- > CH_3O^- > OH^- > RNH_2$

D. $CH_3O^- > NH_2^- > OH^- > RNH_2$

Answer: B

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3. Which of the following species is not electrophilic in nature ?

A. CI^+

B. BH_3

C. H_3O^+

D. $.^+ NO_2$

Answer: C

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4. Homolytic fission of covalent bond leads to the formation of

A. electrophile

B. nucleophile

C. Carbocation

D. free radical

Answer: D

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5. Hyper Conjugation is also known as

A. no bond resonance

B. Baker - nathan effect

C. both (a) and (b)

D. none of these

Answer: C

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6. Which of the group has highest +I effect ?

A. CH_3^-

B. $CH_3CH_2^-$

C. $(CH_3)_2 - CH -$

D. $(CH_3)_3 - C -$

Answer: D

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7. Which of the following specles does not exert a reasonance effect ?

A. C_6H_5OH

B. C_6H_5CI

C. $C_6H_5NH_2$

D. $C_6H_5NH_3$

Answer: D

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8. $-I$ effect is shown by

A. $-CI$

B. $-Br$

C. both (a) and (b)

D. $-CH_3$

Answer: C

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9. Which of the following carbocation will be most stable ?

A. PH_3^+C-

B. $CH_3 - C^+H_2 -$

C. $(CH_3)_2 - C^+H$

D. $CH_2 = CH - CH_3$

Answer: A

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10. Assertion : Tertiary Carbocations are generally formed more easily than primary Carbocations.

Reason : Hyper conjugation as well as inductive effect due to additional alkyl group stabilize tertiary carbonium ions.

A. both assertion and reason are true and reason is the correct explanation of assertion.

B. both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false

D. Both assertion and reason are false

Answer: A

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11. Heterolytic fission of C-C results in the formation of

A. free radical

B. Carbanion

C. Carbocation

D. Carbanion and Carbocation

Answer: C

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12. Which of the following represent a set of nucleophiles?

A. BF_3, H_2O, NH^{2-}

B. $AICI_3, BF_3, NH_3$

C. CN^-, RCH_2, ROH

D. $H^+, RNH_3, \mathbb{C}I_2$

Answer: C

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13. Which one of the following species does not acts as a nucleophile ?

A. ROH

B. ROR

C. PCI_3

D. BF_3^-

Answer: D

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14. The geometrical shape of carbocation is .....

A. Linear

B. tetrahedral

C. Planar

D. Pyramidal

Answer: C

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Textual Evaluation Solved Brief Answer To The Following Questions

1. Write short notes on : (a) Resonance (b) Hyperconjuction

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2. What are electrophiles and nucleophiles? Give suitable examples for each.

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3. Show the heterolysis of covalent bond by using curved arrow notation and complete the following equations.Identify the nucleophile in each case.

(i) $CH_3 - Br + KOH \rightarrow$

(ii) $CH_3 - OCH_3 + HI \rightarrow$

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4. Explain inductive effect with suitable example.

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5. Explain electrometric effect.

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6. Give example for the following types of organic reactions

(i) β- elimination (ii) Electrophilic substitution.

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Additional Questions Solved I Choose The Correct Answer

1. Statement- I: All the organic molecules contain covalent bonds.

Statement-II: Organic molecules are formed by the mutual sharing of electrons between atoms.

A. Statement-I and II are correct and statement -II is correct explanation of statement -I.

B. Statement-I and II are correct but Statement-II not correct explanation of statement-I.

C. Statement-I is wrong but statement -II is correct

D. Statement -I is wrong but statement -II is correct

Answer: A

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2. Statement - I : Homolytic cleavage is symmetrical one.

Statement-II: A single covalent bond breaks and each of the bonded

atoms retains one electron.

A. Statement-I and II are correct and statement -II is correct explanation of statement -I.

B. Statement-I and II are correct but Statement-II not correct explanation of statement-I.

C. Statement-I is wrong but statement -II is correct

D. Statement -I is wrong but statement -II is correct

Answer: A

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3. Which one of the following is an example for free radical initiators?

A. Benzoyl peroxide

B. Benzyl alcohol

C. Benzyl acetate

D. Benzaldehyde

Answer: A

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4. Which one of the following is correct order of stability of alkyl free radicals?

A. $\cdot C(CH_3)_3 > \cdot CH(CH_3)_2 > \cdot CH_> \cdot CH_3$

B. $\cdot CH_3 > \cdot CH_2CH_3 > \cdot CH(CH_3)_2 > \cdot C(CH_3)_3$

C. $\cdot CH(CH_3)_2 > \cdot CH_3 > \cdot CH_2CH_3 > \cdot C(CH_3)_3$

D. $\cdot CH_2CH_3 > \cdot CH(CH_3)_2 > \cdot C(CH_3)_3 > \cdot CH_3$

Answer: A

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5. Statement - I : Hetrolytic cleavage is unsymmetrical one.

Statement-II: A covalent bond breaks and one of the bonded atom retains the bond pair of electrons.

A. Statement-I and II are correct and statement -II is correct explanation of statement -I.

B. Statement-I and II are correct but Statement-II not correct explanation of statement-I.

C. Statement-I is wrong but statement -II is correct

D. Statement -I is wrong but statement -II is correct

Answer: A

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6. Which of the following is correct order of the stability of carbocations?

A. $^{+}CH_3 > {}^{+}CH_2CH_3 > {}^{+}CH(CH_3)_2 > {}^{+}C(CH_3)_3$

B. $^{+}CH_2CH_3 > {}^{+}CH_3 > {}^{+}CH(CH_3)_2 > {}^{+}C(CH_3)_3$

C. $^{+}C(CH_3)_3 > {}^{+}CH(CH_3)_2 > {}^{+}CH_2CH_3 > {}^{+}CH_3$

D. $^{+}CH(CH_3)_2 > {}^{+}CH_3 > {}^{+}CH_2CH_3 > {}^{+}C(CH_3)_3$

Answer: C

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7. Which one of the following is correct order of stability of carbanions?

A. $^{-}C(CH_3)_3 > {}^{-}CH(CH_3)_2 > {}^{-}CH_2 - CH_3 > {}^{-}CH_3$

B. $^{-}CH_3 > {}^{-}CH_2 - CH_3 > {}^{-}CH(CH_3)_2 > {}^{-}C(CH_3)_3$

C. $^{-}CH(CH_3)_2 > {}^{-}CH_3 > {}^{-}CH_2 - CH_3 > {}^{-}C(CH_3)_3$

D. $^{-}CH_2 - CH_3 > {}^{-}CH(CH_3)_2 > {}^{-}CH_3 > {}^{-}C(CH_3)_3$

Answer: B

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8. Which one of the following is not electrophile?

A. NH_3

B. $AICI_3$

C. $FeCI_3$

D. $R - X$

Answer: A

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9. Which one of the following is not nucleophile?

A. H_2O

B. NH_3

C. $R - OH$

D. $FeCI_3$

Answer: D

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10. Which one of the following is positively charged electrophiles?

A. CO_2

B. $AICI_3$

C. BF_3

D. RX

Answer: D

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11. Which one of the following is nucleophile?

A. BF_3

B. $AICI_3$

C. CO_2

D. $R - SH$

Answer: D

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12. Which one of the following species has tendency to show $-I$ effect?

A. $-CH_3$

B. $-CH_2-CH_3$

C. $-CH(CH_3)_2$

D. $-C_6H_5$

Answer: D

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13. Which one of the following species has tendency to show $+I$ effect?

A. $-NH_2$

B. $-CI$

C. $-C_6H_5$

D. $-CH_3$

Answer: D

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14. Which one of the following has strongest acidic character?

A. HCOOH

B. CH_3COOH

C. $CH_2CICOOH$

D. CCI_3COOH

Answer: D

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15. Which one of the following has least acidic character?

A. HCOOH

B. CH_3COOH

C. $CH_2CICOOH$

D. CCI_3COOH

Answer: B

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16. Pick out the correct order of acid strength,

A. $CH_3 - CH_2 - COOH > CH_3COOH > CH_2CICOOH$

B. $CH_3COOH > CH_3 - CH_2 - COOH > CH_2CICOOH$

C. $CH_2CIOOH > CH_3COOH > CH_3 - CH_2 - COOH$

D. $CH_2CIOOH > CH_3 - CH_2 - COOH > CH_3COOH$

Answer: C

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17. Statement-I : Fluoro acetic acid is stronger acid than acetic acid Statement - II: Fluorine has high electronegativity and it is facilitate to dissociate the O-H bond easily.

A. Statement-I and II are correct and statement -II is correct explanation of statement -I.

B. Statement-I and II are correct but Statement-II not correct explanation of statement-I.

C. Statement-I is wrong but statement -II is correct

D. Statement -I is wrong but statement -II is correct

Answer: A

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18. Which one of the following is an example for negative mesomeric effect?

A. $-SH$

B. $-SR$

C. $-NH_2$

D. $-NO_2$

Answer: D

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19. Which one of the following electrophile used for nitration of benzene?

A. $Br^{\oplus}$

B. $NO_2^{\oplus}$

C. $-NH_2$

D. $NO^{\oplus}$

Answer: B

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20. Identify the one which does not come under the organic addition reaction.

A. Hydration

B. Dehydration

C. Halogenation

D. Hydro halogenation

Answer: B

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21. Primary alcohols undergo which type of reaction to form alkenes?

A. Elimination

B. Oxidation

C. Reduction

D. Hydrolysis

Answer: A

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22. $CH_3CHO(\text{ overset O}) \rightarrow CH_3COOH$ .Identify the type of reaction?

A. Addition reaction

B. Elimination reaction

C. Reduction reaction

D. Oxidation reaction

Answer: D

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Additional Questions Solved Match The Following

	List -I	List - II
	(A) Additional reaction	1. Nitration
1.	(B) Elimination reaction	2. Hydration
	(C) Nucleophilic substitution	3.Dehydration
	(C) Electrophilic substitution	4.Hydrolysis of alkyl halides

A. 1,2,3,4

B. 4,3,2,1

C. 2,3,4,1

D. 3,4,2,1

Answer: C

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Additional Questions Solved Fill In The Blanks

1. The slowest step in the mechanism determines .....

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2. Homolytic clevage occurs under the conditions of .....

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3. During the cleavage of Azobisisobutyronitrile produces, ...

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4. The cleavage of C-Br bond in tert-butyl bromide leads to formation of .....

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5. The cleavage of C-H bond in aldehydes leads to formation of .....

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6. Electron displacement occuring in saturated compounds along chain is termed as .....

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7. Acidity of phenol was explained by .....

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8. Hydrolysis of alkyl halide is an example for .....

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9. 4-hydroxy phenol reacts with acidified potassium dichromate to gives .....

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10. Enzyme present in apple is .....

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11. Benzene reacts with H_2 in the presence of Pt to give .....

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12. Alcohol on refluxing with $K_2Cr_2O_7$ gives .....

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13. Carbonyl compoundsespecially ketones undergo reduction to form .....

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14. Ethane undergo homolytic cleavage to form .....

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Additional Questions Solved Choose The Odd One Out

1. Choose the odd one out

A. NH_3

B. H_2O

C. CN^-

D. RSH

Answer: C

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2. Choose the odd one out

A. CO_2

B. RX

C. $AICI_3$

D. $FeCI_3$

Answer: B

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3. Choose the odd one out

A. $-F$

B. $-CI$

C. $-COOH$

D. CH_3O^-

Answer: D

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4. Choose the odd one out

A. $-C(CH_3)_3$

B. $-COOH$

C. $-CH(CH_3)_2$

D. $-COO^-$

Answer: B

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5. Choose the odd one out

A. $-OH$

B. $-NH_2$

C. $-SH$

D. $-COOH$

Answer: D

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Additional Questions Solved Choose The Correct Pair

1. Choose the correct pair.

(a) Homolytic clevage : carbocation

(b)Homolytic clevage : carbanion

(c) Homolytic clevage : free radicals

(d)Hetrolytic clevage : free radicals

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2. Choose the correct pair.

A. (a)$+C(CH_3)_3 > .^+ CH(CH_3)_2 > CH_2 - CH_3 > CH_3$

Relative stability of carbocation

B.

$(b) - C(CH_3)_3 > .^- CH(CH_3)_2 > .^- CH_2 - CH_3 > .^- CH_3$

, Relative stability of carbanion

C. (c)OH^-, RO^-, $RCOO^-$, Neutal nucleophile

D. $(d) AICI_3$, BF_3, $FeCI_3$, Positively charged nucleophile

Answer: A

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3. Choose the correct pair

A. $CH_3 - CH_2 - CH_2Br$ + Alcoholic KOH, Substitution reaction

B. $CH_3 - CH_2 - CH_2Br$+ Alcoholic KOH Elimination reaction

C. (c)CH_3CHO + Acidic dichromate Reduction reaction

D. (d)Benzene + Pt + H_2: Oxidation reaction

Answer: B

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Additional Questions Solved Choose The Incorrect Pair

1. Choose the incorrect pair.

A. $-OH,\ -SH,\ -NH_2$ Positive mesomeric effect

B. $-NO_2 > CO,\ -COOH$ Negative mesomeric effect

C. $-F,\ -CI,\ -NO_2$: Electron withdrawing group

D. $-C(CH_3)_3,\ -CH(CH_3)_3,\ -CH_2-CH_3$ Electron withdrawing group

Answer: C

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2. Choose the incorrect pair.

A. NH_3 and Amines Neutral nucleophile

B. OH^- and $RCOO^-$ Negative nucleophile

C. RX and H_3O^+ Positive electrophile

D. $AICI_3$, BF_3 Negative electrophile

Answer: D

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3.

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Additional Questions Solved Assertion And Reason

1. Assertion(A) : Neutral molecule $SnCI_4$ can act as an electrophile.

Reason (R) : It has vaccant 'd' orbitals which can accommadate the

electrons from others.

A. Both(A) and (R) are correct and (R) is the correct explanation of (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong

D. (A) is wrong but (R) is correct

Answer: A

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2. Assertion (A) : The C-C bond in ethane is non-polar while the C-C bond in ethyl chloride is polar.

Reason(R) : Chlorine is more electronegative than carbon and hence it attracts the shared paired of electron between C - CI in ethyl

chloride and it develops a negative charge on CI and positive charge on Carbon.

A. Both(A) and (R) are correct and (R) is the correct explanation of (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong

D. (A) is wrong but (R) is correct

Answer: B

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3. Assertion (A) : Phenol is more acidic than aliphatic alcohols.

Reason (R): The phenoxide ion is more stabilized than phenol by

resonance effect and hence resonance favours ionization of phenol to form H^+ and shows acidity.

A. Both(A) and (R) are correct and (R) is the correct explanation of (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong

D. (A) is wrong but (R) is correct

Answer: A

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4. Assertion (A) : The cut apple turns brown.

Reason (R) : Cut apple exposes its cells to atomspheric oxygen and

the oxidises the phenolic compound present in it.Due to this enzymatic browning the cut apple turns brown.

A. Both(A) and (R) are correct and (R) is the correct explanation of (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

C. (A) is correct but (R) is wrong

D. (A) is wrong but (R) is correct

Answer: B

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Additional Questions Solved 2 Marks Questions

1. What are organic reactions?

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2. What is mechanism of the reaction?

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3. Mention the types of fission of a covalent bond?

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4. Explain the homolytic fission of a covalent bond?

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5. What are free radical initiators?

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6. Mention any two examples for free radical initiators?

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7. Explain the hetrolytic fission of a covalent bond?

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8. What are carbocations?

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9. What are carbanions?

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10. Differentiate the carbocation and carbanion

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11. Identify which of the following are electrophiles and nucleophiles?

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12. How will you distinguish between electrophiles and nucleophiles?

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13. What are the sources of the human body that produces free radicals?

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14. In what way free radical affect the human body?

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15. How to reduce the effect of free radicals?

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16. Identify which of the following shows $+I$ and $-I$ effect?

(i) $-NO_2$ (ii) $-SO_3H$ (iii) $-I$ (iv) $-OH$ (v) CH_3O- (vi) CH_3-

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17. Why chloro acetic acid is stronger acid than acetic acid?

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18. Explain the positive and negative electromeric effect?

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19. Write a short notes on positive mesomeric effect?

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20. Write a short notes on negative mesomeric effect?

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21. What are addition reactions? Give an example.

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22. What are elimination reaction? Give an example.

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23. What are organic oxidation reactions? Give an example.

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24. What are organic reduction reactions? Give an example.

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25. Why cut apple turns a brown colour?

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26. What are functional group inter conversions?

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27. How will you convert alcohol into aldehyde?

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28. What happen when nitrile undergoes acid hydrlysis?

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29. Complete the following reaction and identify the products?

(a) $CH_3 - CH_2 - Br \xrightarrow{(\text{alc. KOH})} ?$

(b) $CH_3 - CH_2 - Br \xrightarrow{(\text{aq.KOH})} ?$

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30. Predict the product for the following reaction.(i) 

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31. How will you convert benzene into cyclohexane?

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32. Complete the reaction and name the product 

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33. Identify the product and mention the type of organic reaction

$$CH_3 - \overset{\overset{Br}{|}}{C}H - CH_3 \xrightarrow[C_2H_5ONa]{C_2H_5OH} ?$$

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34. Complete the following reaction and identify the product.

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35. What are substitution reaction?

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36. How will substitution reactions are classified?

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37. Draw the resonance structurs for the following compounds?(a) $CH_3CH = CHCHO$ (b) $CH_3CH = CHC^{\oplus}H_2$ (c) CO_2

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38. Identify the reagents shown in box in the following equations as nucleophiles or electrophiles.

(a) 

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39. Classify the following reactions in one of the reaction type of organic reaction.

(a)$CH_3CH_2Br + S^{\oplus}H \rightarrow CH_3CH_2SH + B^{\oplus}r$

(b) $(CH_3)_2C = CH_2 + HCI \rightarrow (CH_3)_2\mathbb{C}I - CH_3$

(c) $CH_3CH_2Br + O^{\oplus}H \rightarrow CH_2 = CH_2 + H_2O + B^{\oplus}r$

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40. Which electron displacement effect explain the following correct orders of acidity of the carboxylic acids?

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41. Which of the two,$NO_2CH_2CH_2O^{\oplus}$ or $CH_3CH_2O^{\oplus}$ is expected to be more stable and why?

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Additional Questions Solved 5 Marks Question

1. Explain electron movement in organic reactions.

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2. How does inductive effect influence the reactivity and acidity of carboxylic acids?

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3. Explain the acidic nature of phenol.

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4. How does hyper conjugation effect explain the stability of alkenes?

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5. Explain the types of addition reactions?

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6. Explain the types of substitution reaction?

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7. For the following bond cleavages use curved- arrows to show the electron flow and classify each as homolytic or hetrolytic fission.Identify reactive intermediate produced as free radical, carbocation and carbanion?

(a) 

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8. An organic compund (A) has a molecular formula C_2H_6O it is one of the primary alcohol. A reacts with acidified potassium dichromate to give B.B on further undergoes to oxidation reaction to give C.C on reacts with $SOCI_2$ to give D which is chlorinated product.Identify A,B,C and D, explain the equation.

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9. An organic compound (A) of a molecular formula C_2H_4 which is a simple alkene. A reacts with dil H_2SO_4 to give B.A again reacts with CI_2 to giveC. Identify A,B and C and write the equations.

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10. Complete the reactions and identify the products.

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