ORGANIC CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP No. 13

Total Marks : 28

Max. Time : 29 min.

Topic : Hydrocarbons

Type of Questions		M.M., Min.
Single choice Objective ('–1' negative marking) Q.1 to Q.8	(3 marks, 3 min.)	[24, 24]
Subjective Questions ('–1' negative marking) Q.9	(4 marks, 5 min.)	[4, 5]

1. The correct order of alkene reactivity towards an electrophile is mentioned in-

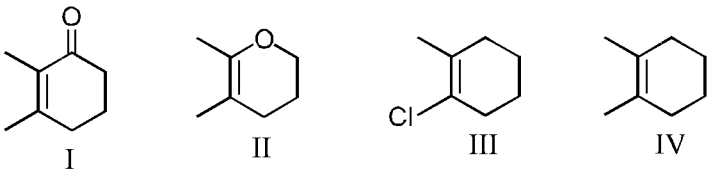
(A) CH_2=CH–Cl > CH_2=CH–OCH_3

(B) CH_2=CHCl < CH_2=CCl_2

(C) ethene > propene

(D) CH_2 = CH – OCH_3 > CH_2=CH–CH_2–OH

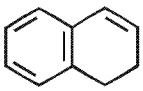
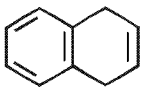
2. The correct relative rate of reaction of the given alkenes for any given electrophiles is



I II III IV

(A) I > II > IV > III (B) II > IV > III > I (C) II > III > IV > I (D) IV > I > III > II

3. The correct order of reactivity towards electrophilic addition reaction :

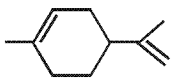
(I) CH_3–C≡CH (II) CH_2=CH_2 (III)  (IV) 

(A) II > I > IV > III (B) III > I > IV > II (C) I > III > IV > II (D) III > IV > II > I

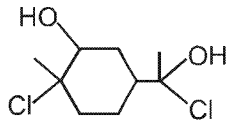
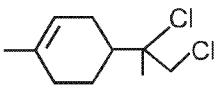
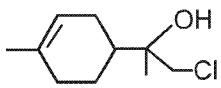
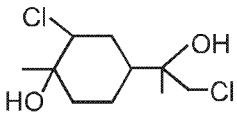
4. The correct order of HOCl/H^+ addition reaction with the following is :

(I) (II) (III) (IV)

(A) I > II > III > IV (B) II > I > IV > III (C) III > II > I > IV (D) IV > II > III > I

5.  $\xrightarrow[\text{(excess)}]{Cl_2/H_2O}$ 'X',

Compound 'X' will be :

(A)  (B)  (C)  (D) 

6. Which of the following statements is correct ?

(A) Alkynes are more reactive than alkenes towards halogen addition.

(B) Alkenes are more reactive than alkynes towards halogen addition

(C) Both alkynes and alkenes are equally reactive towards halogen addition

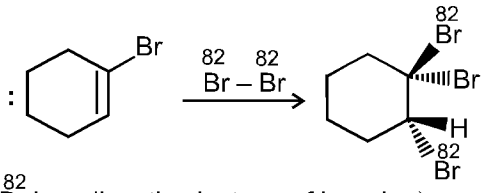
(D) Primary vinylic cation $RCH=\overset{\oplus}{C}H$ is less reactive than secondary vinylic cation $R\overset{\oplus}{C}=CH_2$

7. Mention True (T) and false (F) out of the following statements :

S_1 : In hydroboration oxidation of alkene, H and OH are introduced with a regioselectivity opposite to that of Markownikove`s rule.

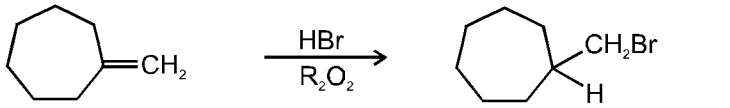
S_2 : Electrophilic addition of HCl to 2-methyl propene is reverse of E^1 elimination reaction of tert-butyl chloride.

S_3 :



(^{82}Br is radioactive isotope of bromine)

S_4 :

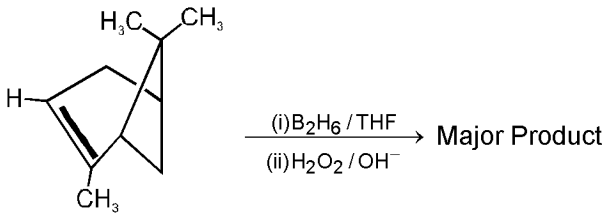


methylene cycloheptane bromomethyl cycloheptane

Codes :

(A) T T T T (B) T T T F (C) T F T F (D) F T F T

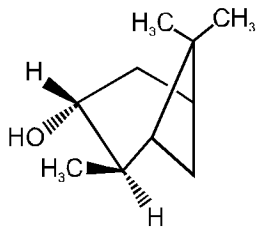
8.



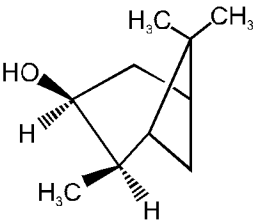
α - pinene

The products P and Q are respectively -

(A)



(B)



(C) A & B both (D) None of these

9. An unsaturated organic compound (A) of molecular formula C_9H_9Cl decolourise Br_2/H_2O and produces another unsaturated compoud (B) of molecular formula C_9H_8 in treating with sodamide in liquid ammonia. (B) on hydration using Hg^{++}/H_2SO_4 gives (C) which on vigorous oxidation produces an aromatic dibasic acid (D) giving only one mono nitroproduct. An isomer (E) of (B) on oxidation gives a monobasic acid of molecular mass 122.

Answer Key

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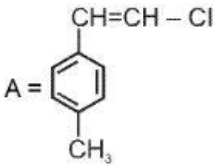
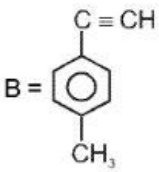
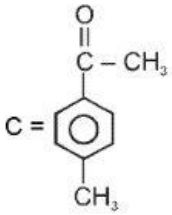
1.	(D)	**2.**	(B)	**3.**	(D)	**5.**	(D)	**6.**	(B)
7.	(A)	**8.**	(A)						

9. A = 

B = 

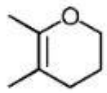
C = 

Hints & Solutions

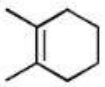
DPP No. # 13

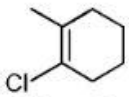
1. Electron releasing group and stability of carbocation will decide rate of reaction in electrophilic addition reaction.

2.

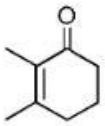


More nucleophilic more stable carbocation


+I and hyperconjugative effects of $-CH_3$ group stabilize the carbocation

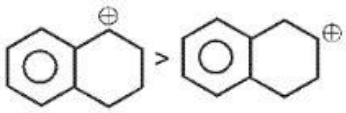


–Cl is an electron withdrawing group



–M effect of $>C=O$ group makes alkene less nucleophilic and destabilizes the carbocation

3. Rate of electrophilic addition reaction α stability of C^+ produced

$\because$  > $\overset{\oplus}{C}H_2–CH_3$ > $CH_3—\overset{\oplus}{C}=CH_2$ [stability]

6. Conceptual

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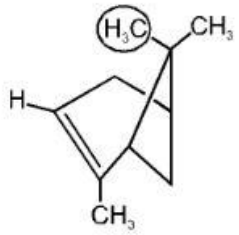
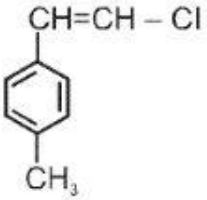
8. 

H_3C methyl group shields top face, and bottom face of α-pinene is less hindered hence hydroboration of α-pinene is observed to be 100% stereoseleetive and syn addition takes place. Anti markownikove`s product in case of hydroboration.

9. A = 

B = 

C =