meceP eeFS~

Unit - I

FkeâeF - I

2. (a) When an aqueous solution of potassium propionate is electrolyzed a mixture of n-butane ethane, ethylene and ethyl propionate is obtained. Give a suitable mechanism for the formation of all the above products. 7½

peye heeŠeMeÙece ØeeeheÙeeveš keâ Skeâ peueeÙe eJeueÙeve keâe eJeÅeleekeâjCe ekeâÙee peelee n, n-yÙeŠve, FLeve, FLeeFueeve leLee SLeeFue ØeeeheÙeeveš keâe Skeâ eceßeCe Øeehle nelee n~Fve meYee GheÙeòeâ Glheeoe keâ yeveve keâe Skeâ GeÛele e›eâÙeeeJeeOe oeepeS~

(b) Write the type of hybridization of each of the carbon atom in the following structures :

evecve mejÛeveeDee ce ØelÙekeâ keâeyeve keâe (mekeâjCe) neFeye[eFpeMeve yeleeÙe :

(i) $CH_2 = C = CH_2$

(ii) $CH_3–CH = CH – CH_3$

3. (a) How can you prepare free radicals by thermolysis, photolysis and redox reaction? Give one example in each case. 7½

A (Printed Pages 8)

Roll No. _____

S-620

B.Sc. (Part-I) Examination, 2015

CHEMISTRY

Second Paper

(Organic)

Time Allowed : Three Hours] ***[Maximum Marks : 50***

Note : Answer five questions in all. Question No. 1, which is compulsory. Attempt one question from each unit.

keâue heeÙe ØeMvee keâ Gòej oeepeS~ ØeMve me. 1 DeeveJeeÙe n~ ØelÙekeâ FkeâeF me Skeâ ØeMve keâeepeS~

1. Attempt all parts : 2×10

meYee Yeeie nue keâeepeS :

(i) In the following reaction, predict the product:

evecveeueeKele DeeYee›eâÙee ce Glheeo yeleeFS :

$$CH_2=C=CH_2 \xrightarrow[(ii)\ Zn/H_2O]{(i)\ O_3/CH_2Cl_2}$$

(ii) Isobutene, $(CH_3)_2C = CH_2$, is more stable than 2-butene, $CH_3CH=CH–CH_3$. Give a

reason.

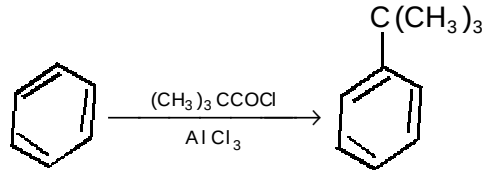
DeeFmeeyÙeŠeve, $(CH_3)_2C = CH_2$ keâe emLejlee 2-JÙeŠeve, $CH_3-CH=CH-CH_3$ me DeeOekeâ nelee n~ keâejCe oeepeS~

(iii) Only Y-isomer of 1, 2, 3, 4, 5, 6-hexachlorocyclohexane is a powerful insecticide. Explain.

1, 2, 3, 4, 5, 6 nkemeekeueejemeeFkeueenkemeve keâe Y-DeÙeJeÙe ne keâJeue Skeâ Øeyeue keâeŠveeMekeâ n~ mecePeeFS~

(iv) Explain the following transformation mechanistically:

evecveeueeKele ¤heevlejCe keâe e>eâÙeeeJeeOe Éeje mecePeeFS:



(v) Why Kekule benzene's more stable than Dewar benzene?

keâkeâue yepeeve me oJeej yepeeve keÙee DeeOekeâ emLej nelee n?

(vi) Explain the terms enantiomer and diastereomer giving examples.

GoenjCe ole nS FveevMeÙeecej leLee [eÙemšeejÙeecej heoe keâe mecePeeFS~

(vii) What do you understand by singlet and triplet carbene?

emeieueš leLee ešheueš keâeyeeve me me Deehekeâe keÙee DeeYeØeeÙe n?

(viii) Write the s-cis and s-trans structures of 1, 3-butadiene. Also comment upon their stabilities.

s-cis leLee s-trans 1, 3-JÙeše[eFve keâe mejÛevee eueeKeS~ Gvekeâe emLejlee hej Yee Deheve eJeÛeej oeepeS~

(ix) CH_3OCH_2Cl is hydrolyzed exceedingly at a very high rate than CH_3CH_2Cl. Offer suitable explanation.

CH_3OCH_2Cl keâe peueDehelešve CH_3CH_2Cl keâe Dehe#ee yenle DeeOekeâ ieele me nelee n~ GeÛele {ie me mecePeeFS~

(x) In the chlorination of methane, in the presence of sunlight, presence of oxygen stops the chlorination for a short period of time. Give a satisfactory explanation.

ceeLeve keâ keueejekeâjCe ce, meÙe keâ ØekeâeMe keâe GheemLeele ce, Deekemeepeve keâe GheemLeele keueejekeâjCe keâe Deuhe meceÙe keâ eueS DeJejeeOele keâj olee n~ mevlee<epevekeâ {ie me

Unit - IV

FkeâeF - IV

8. (a) Give the mechanism of the chlorination of Benzene in the presence and absence of sunlight. 4+3½

yepeeve keâ keueejekeâjCe keâe e>eâÙeeeJeeOe meÙe keâ ØekeâeMe keâe GheemLeele leLee DeveheemLeele ce oeepeS~

(b) Benzene, toluene, xylenes (o,m,p) and mesitylene dissolve in HBF_4 to form salts. Explain the order of basicity :
mesitylene > m-xylene> o-and p-xylenes> toluene> benzene.

yepeeve, šeueÙeeve, peeFueeve (o,m,p) leLee ceemeeŠueeve HBF_4 ce eJeueÙe nekeâj ueJeCe yeveele n~ ye{lee nÙee #eejeÙelee ceemeeŠueeve > m-peeFueeve>o leLee p-peeFueeve >šeueÙeeve >yepeeve keâe mecePeeFS~

9. (a) What is the resonance energy? Calculate the resonance energy of benzene.

Deveveeo Tpee keÙee n? yepeeve keâe Deveveeo keâe ieCevee keâeepeS~ 3½+2+2

(b) How can you synthesize DDT?
DDT keâe meMue<eCe Deehe keâme keâj mekeâle n?

(c) Why benzylchloride is hydrolyzed more rapidly than chlorobenzene?

yeepeuekeueejeF[keâe peue Dehelešve keueejeyepeeve me DeeOekeâ lee>elee me keÙee nelee n?

ceòeâ ceuekeâ keâe Deehe T<ceeÙe Dehelešve, ØekeâeMeeÙe Dehelešve leLee DeheÛeÙeve-Deekemeekeâjce DeeYee>eâÙeeeÙee me keâme yevee mekeâle n? ØelÙekeâ oMee ce Skeâ Goenjce oeepeS~

(b) Comment upon the Banana bonds.

yeveevee yeOe hej Deheve eJeÛeej oeepeS~

Unit - II

FkeâeF - II

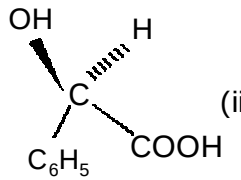
4. (a) Draw the potential energydiagram for the various conformations of n-butane and explain their relative stabilities. 5½+2

n-JÙešve keâ eJeeYeVe me¤heCe keâe Gvekeâ emLeelepe Tpee Deejke ce yeleeFS leLee Gvekeâe Dehe#eekeâle emLejlee yeleeFS~

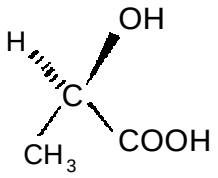
(b) Assign 'R' or 'S' configuration in the following :

evecve ce 'R' DeLeJee 'S' eJevÙeeme keâe eÛeeÖle keâeepeS :

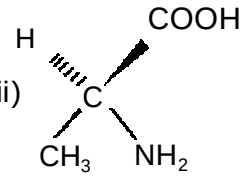
(i)



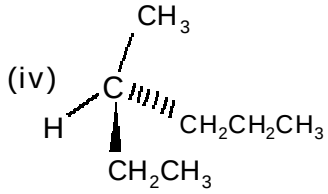
(ii)



(iii)



(iv)

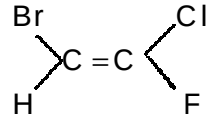


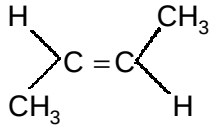
5. (a) Giving examples differentiate threo and erythrodiastereomers. 3½ + 2 + 2

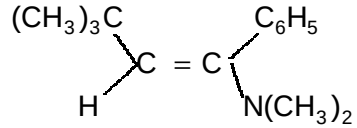
GoenjCe ole nS eLeÙee leLee FejLee [eÙemšeejÙeecej ce eJeYeo keâeepeS~

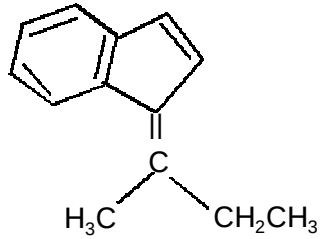
(b) Assign 'E' or 'Z' configuration in the following :

evecve ce 'E' DeLeJee 'Z' eJevÙeeme eÛeeÖle keâeepeS :

(i) 

(ii) 

(iii) 

(iv) 

(c) What are the meso compounds?

ceepee Ùeeeiekeâ keÙee n?

Unit - III

FkeâeF - III

6. (a) How can you synthesize an alkene by the chugaev reactions? 4 + 3½

Skeâ Sukeâeve keâe meMue<eCe Deehe MeieJe DeeYee>eâÙee me keâme keâj mekeâle n?

(b) What happens when propyne is treated with dilute H_2SO_4 and Hg^{2+}?

keÙee nelee n peye ØeeheeFve keâe leve H_2SO_4 leLee Hg^{2+} me e>eâÙee keâjeÙee peelee n?

7. (a) Give the mechanism of the following conversion. 3 + 4½

evecveeueeKele heejJeleve keâe e>eâÙeeeJeeOe oeepeS~

$$R-CH=CH_2 \xrightarrow[NaOH]{\text{(i) } B_2H_6 \text{ (ii) } H_2O_2} RCH_2CH_2OH$$

(b) Show the formation of products B,C and D from the dehydration of alcohol A mechanistically:

Sukeâenue A keâ evepeueekeâjCe me Glheeo B, C leLee D keâ yeveve keâe e>eâÙeeeJeeOe oeepeS :

$$(CH_3)_2CHCH_2OH \xrightarrow{H^{\oplus}} \underset{(A)}{(CH_3)_2C-CH_2} + \underset{(B)}{CH_3CH=CHCH_3} + \underset{(C)}{CH_2=CHCH_2CH_3}$$

(D)