

AS-2159

**Model Answer for
M.Sc. (Third Semester) Examination, 2013
CHEMISTRY**

(Specialization – Organic Chemistry)

Paper CMT – 304 (O)

(Natural Products)

By

Dr. Subhash Banerjee

Section - A

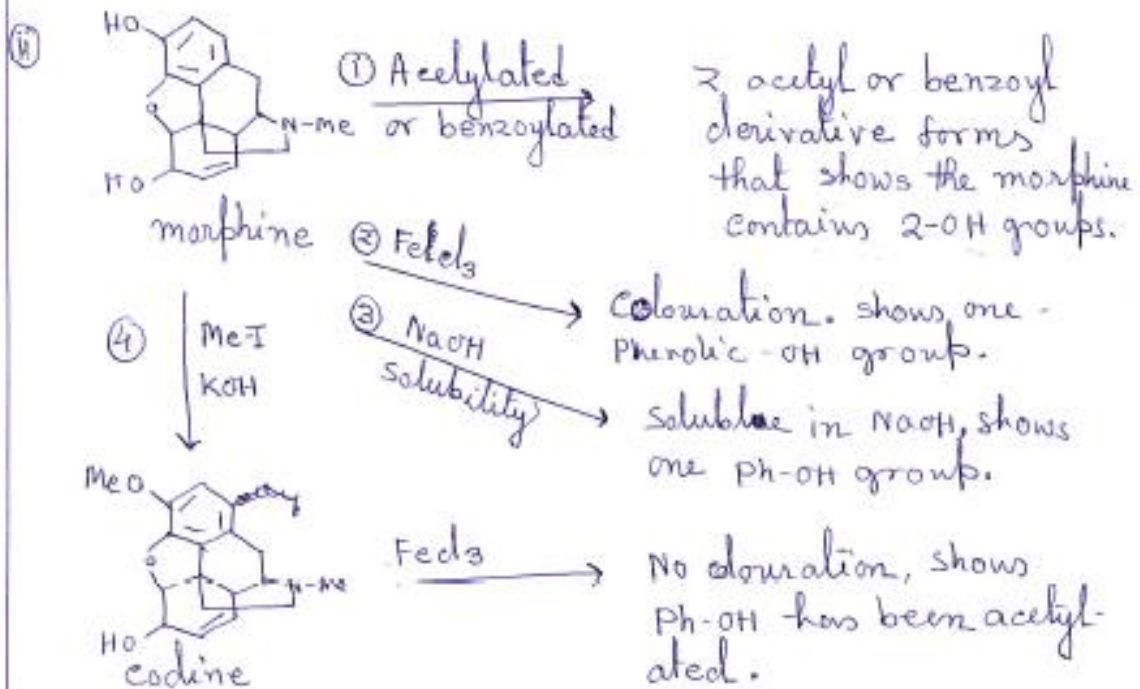
Section - A

①

③ ① Alkaloid :- The basic nitrogenous plant products, mostly optically active and possessing nitrogen heterocycles as their structural units with pronounced physiological action.

■ Morphine - Nicotinal analgesic.

Reserpine - Anti hypertensive agent, also used for the treatment of insanity, anxiety, snake bite and other disorders.

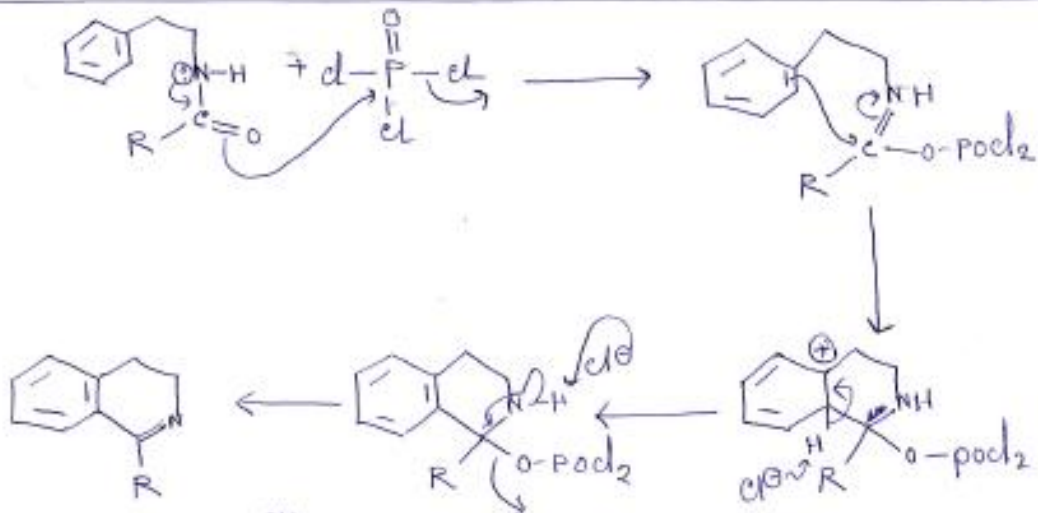


From reaction ①, proved two -OH group present.

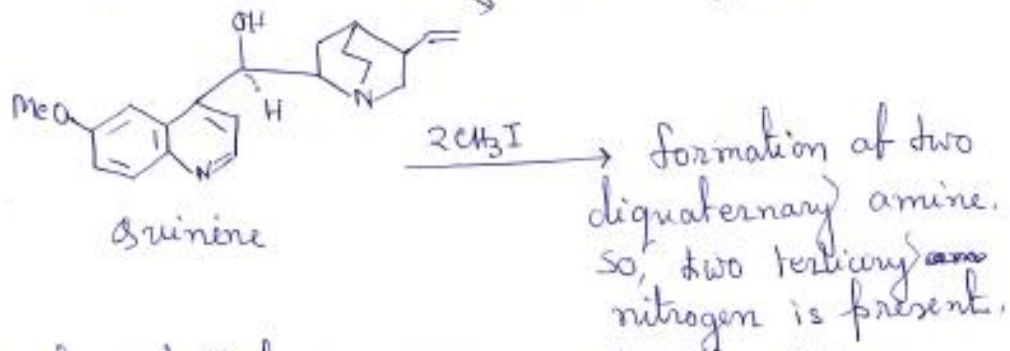
From reaction ② and ③, Proved ~~one of them~~ that ~~is~~ phenolic -OH group. is present.

From reaction ④, ~~one~~ proved that one of them is phenolic -OH group.

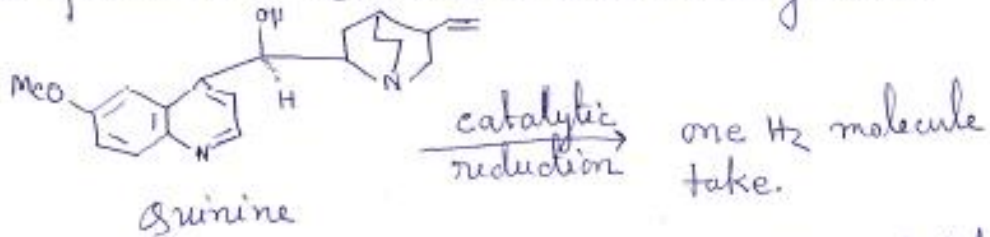
(iii)



(iv)



It proved that quinine is a di-tertiary base.

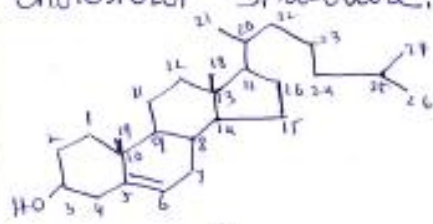


It proved that, quinine has one ethylenic double bond.

(v)

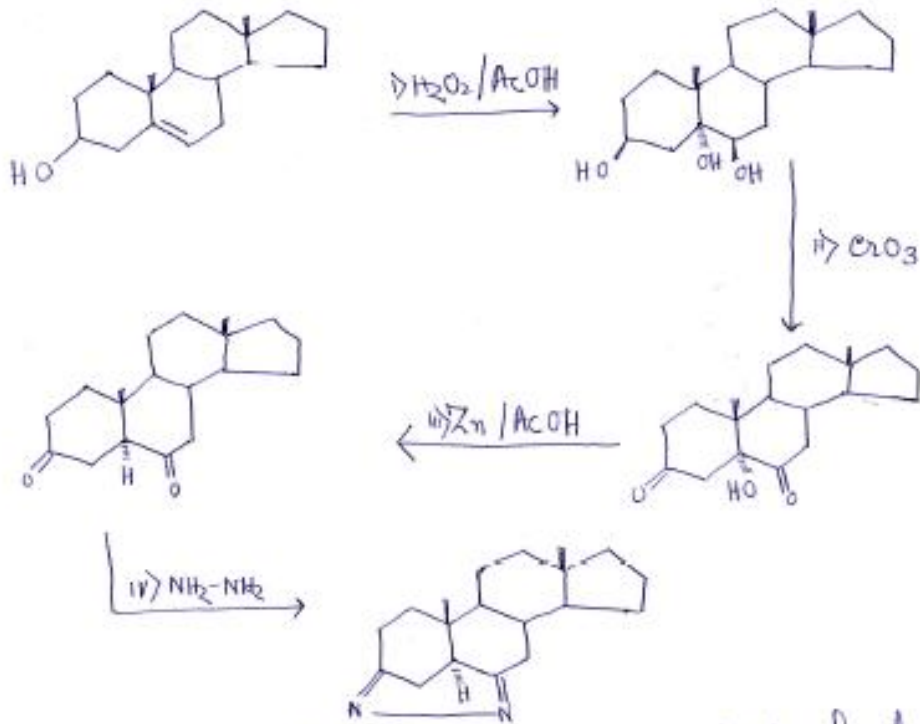
~~Abietic~~ Abietic acid form adduct with maleic-
~~anhydride~~ anhydride at above 100°C, it was assume
that the two double bonds are conjugated.

(vi) Cholesterol Structure:-



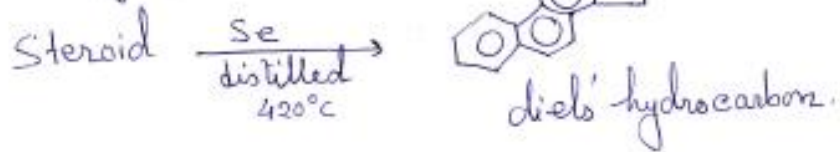
Stereocentre:- 3, 8, 9, 10, 13, 14, 17, 25, 20

(vii)

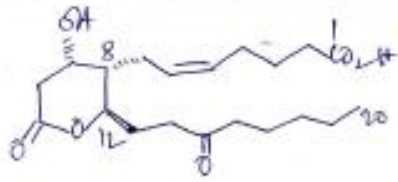


(viii)

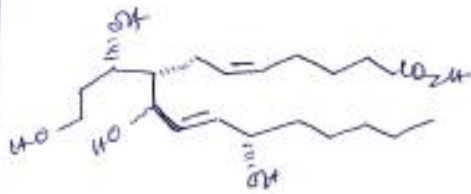
~~All~~ Diels hydrocarbon → One of the product on dehydration of steroids with Se.



(x)



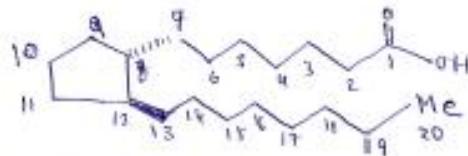
9 α ,11-dihydroxy-15-oxo-thromboxane-5,20-enoic acid.



8-(1,3-dihydroxypropyl)-9,12-(S)-dihydroxy-5Z,10E-hepta-decaenoic acid.

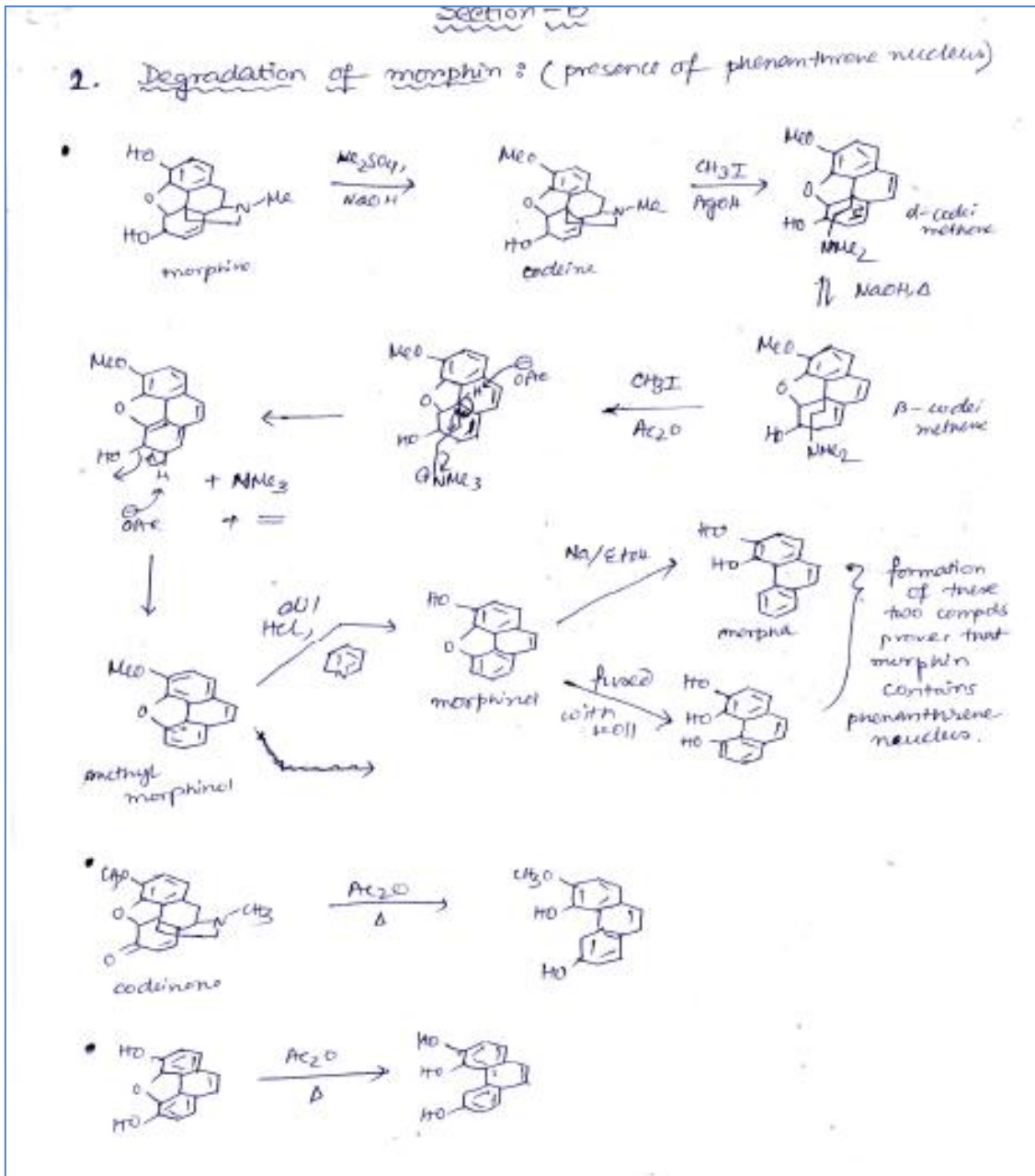
(x)

The basic structural unit of PG₁ is prostanoic acid. It constituted five membered

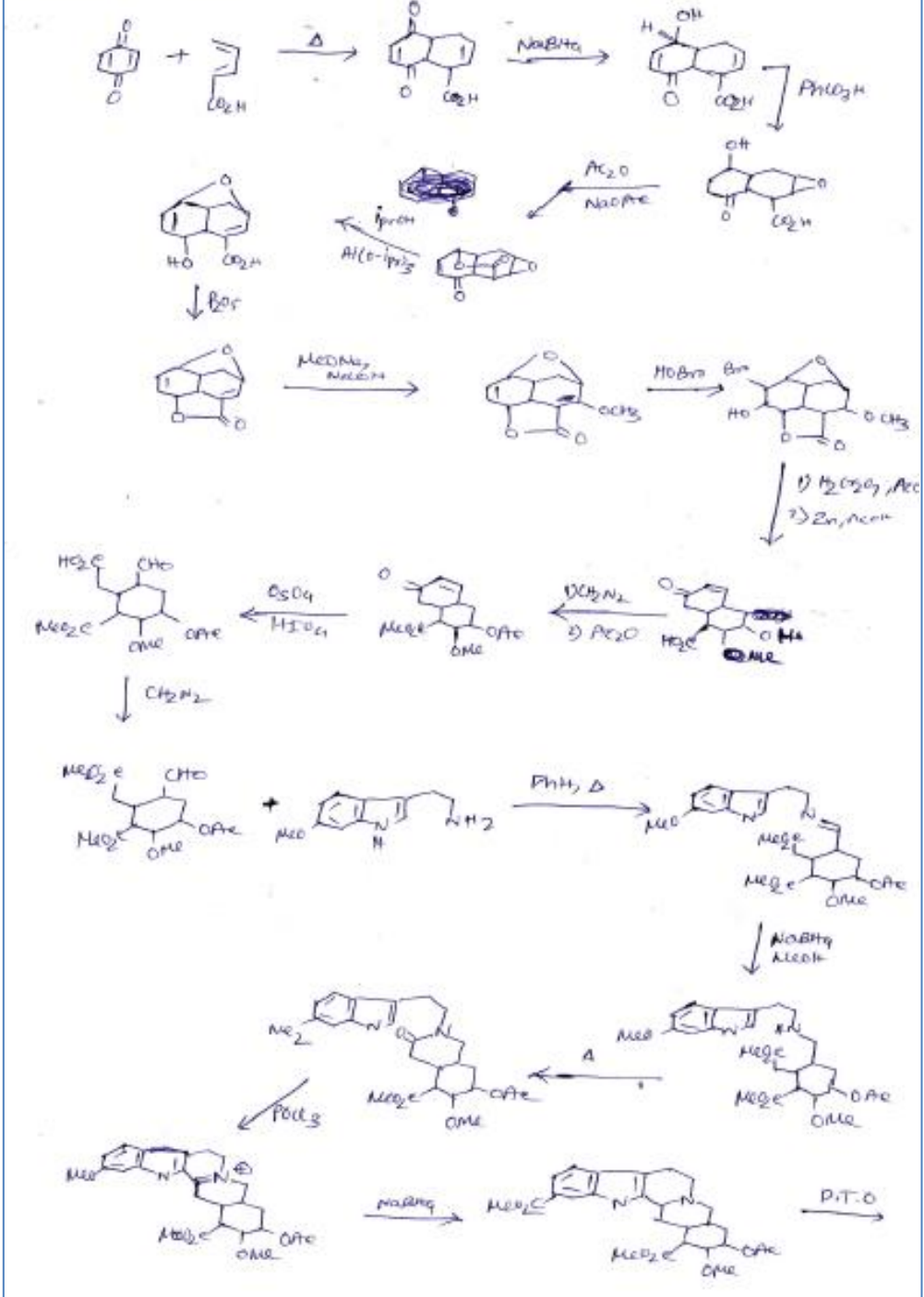


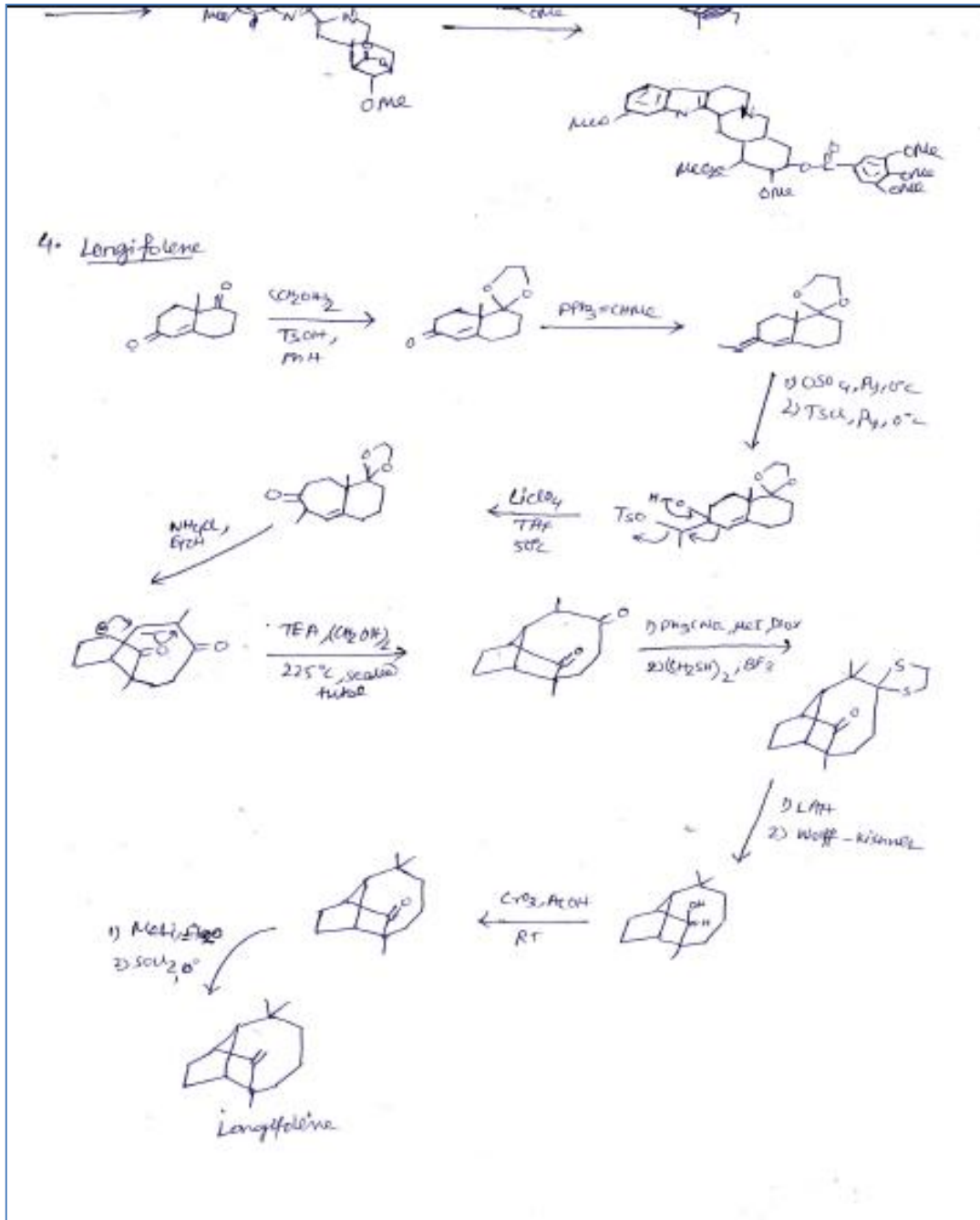
- i) The capital letter A, B, C, E, F denotes the state of oxidation and position of the double bond in the cyclopentane ring.
- ii) The number of subscript refers to the number of double bond in side chain.
 when subscript,
 - 1 \rightarrow trans at C₁₃
 - 2 \rightarrow cis at C₅, trans at C₁₃
 - 3 \rightarrow cis at C₅, trans at C₁₃, cis at C₁₇.
- iii) α (below) and β (above) indicate the position of -OH group at C₉.

Section - B

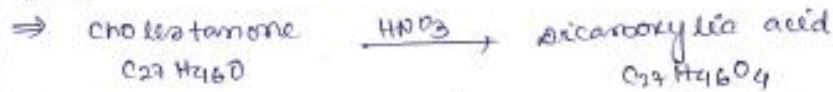


• Reserpine (synthesis)

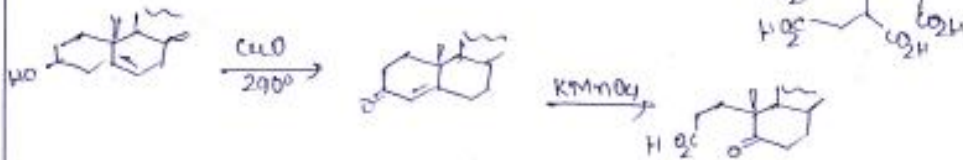
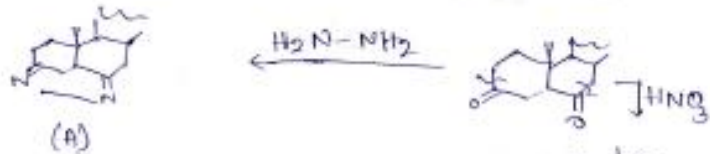
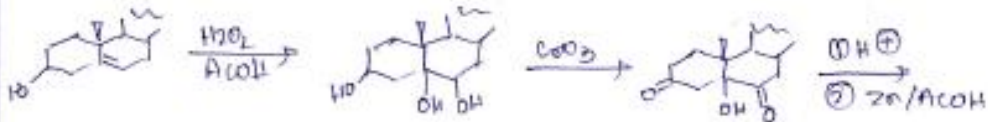
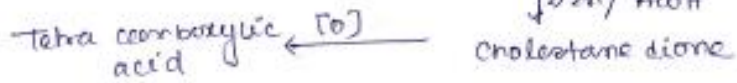
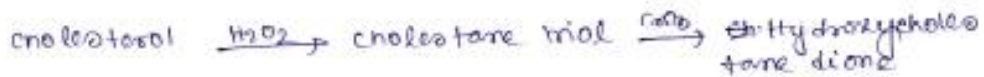
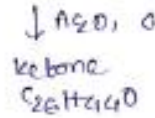




Q) Determine the position and nature of hydroxyl group and double bond in cholesterol.



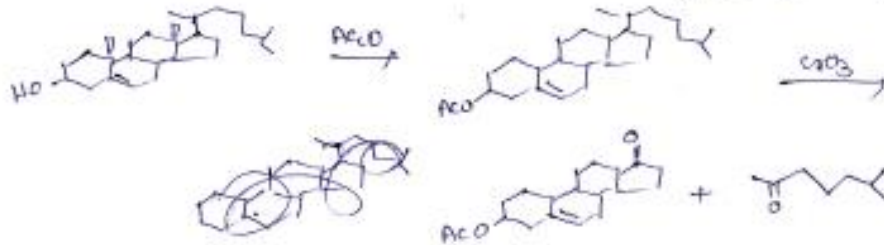
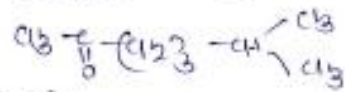
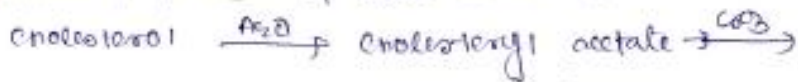
Presence of $-CH_2-\overset{\overset{O}{\parallel}}{C}-CH_2-$ group indicate presence of $-OH$



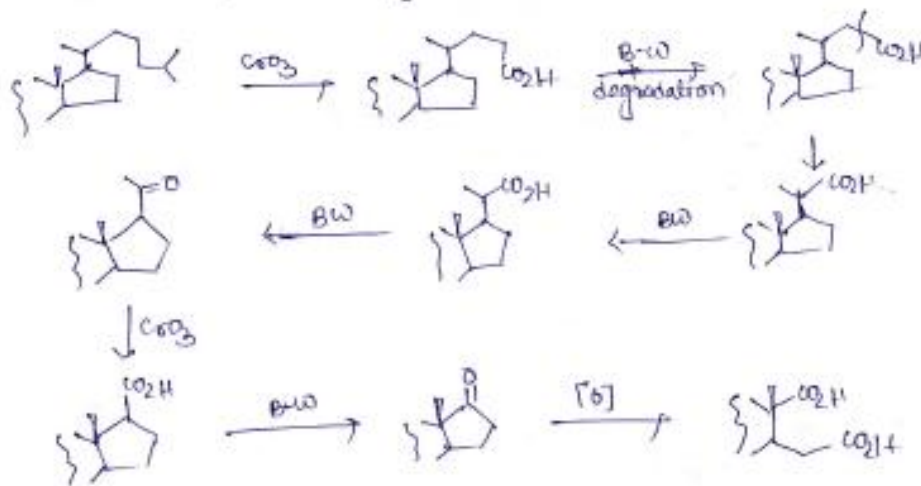
The compound (A) indicates $-OH$ and $=$ present in two different rings. This also prove $-OH$ group is present at C_3 and C_6 double bond is present between C_5 and C_6

(15)

⑤ Nature & position of side chain \rightarrow



⑥ oxidation followed by B-O



⑥ How you will bring the following transformation. Give the structure of the products.

