



Department: Chemistry



Exam Jan. 2026

Course Title:



Chemistry of Natural Products

Code number: Organic Chemistry (419) : fourth year general chem.

Time: 3 hours

Marks: 40

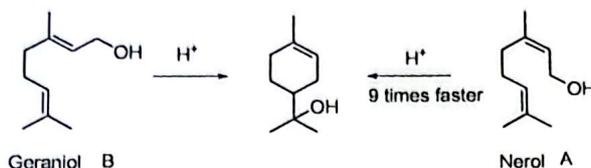
Date: 28-12-2025

Natural products part

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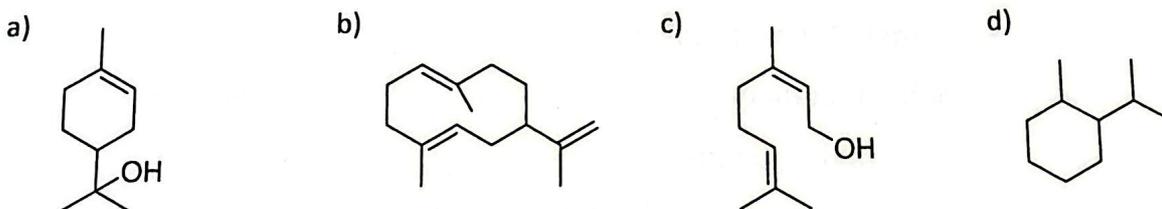
Q1) Choose the correct answer for the following (15 marks, 1.5 marks each)

1) In the following cyclization reactions:



Cyclization A is 9 times faster than cyclization B because:

- a) Nerol is more active b) The carbocation generated in the case of geraniol needs to rotate the bond first in order to complete cyclization
- c) Geraniol has trans double bond d) None of the above
- 2) Myrcene, $C_{10}H_{16}$, upon catalytic hydrogenation produces a compound with a molecular formula of $C_{10}H_{22}$. This indicates:
- a) Myrcene has 3 double bonds b) Myrcene has no double bonds
- c) Myrcene is an aromatic compound d) None of the above
- 3) Which of the following terpenes is not following the isoprene rule?



4-The best classification method for studying natural products is:

- a) that based on taxonomy b) that based on biogenesis
- c) that based on carbon skeleton d) that based on physiological activities

5- Shikimic acid pathway

- a) starts with phosphoenolpyruvate and erythrose 4-phosphate
- b) produces terpenoids as final products
- c) produces shikimic acid as a final product
- d) produces fatty acids as final products

6- Mevalonic acid pathway produces

- a) Fatty acids
- b) acetogenins
- c) isoprene unit
- d) polyketides

7- Squalene is the precursor of:

- a) monoterpenes
- b) diterpenes
- c) triterpenes
- d) tetraterpenes

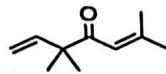
8- The precursor of diterpene is:

- a) geraniol
- b) farnesol
- c) squalene
- d) geranylgeraniol

9- The precursor of steroids:

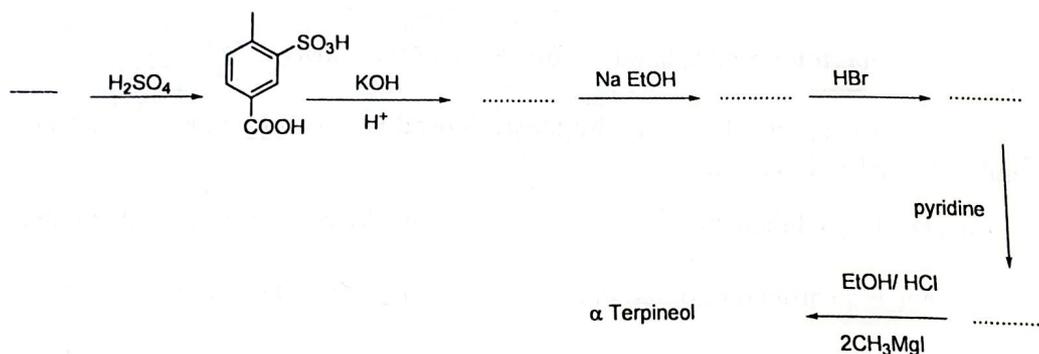
- a) cholesterol
- b) lanosterol
- c) geraniol
- d) squalene

10- The precursor of Artemisia ketone is:



- a) caryophyllene
- b) geraniol
- c) orcinol
- d) phloroglucinol

Q2) Complete the following equations: (5 marks,)



Q3) Illustrate by chemical equations the biogenetic conversion of: (15 marks,)

- i. Farnesol to the eudesmane (5 marks)
- ii. Geraniol to borneol (5 marks)
- iii. Farnesol to the guaiane (5 marks)

Q4) Illustrate by chemical equations the following conversions:

1- Citral to a mixture of α - and β -ionones

2- p-toluic acid to α -terpineol