

This question paper contains 4 printed pages]

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S. No. of Question Paper : **5321**

Unique Paper Code : **2174001212**

Name of the Paper : **GE : Chemistry of Fragrances and Flavors :
An Industry's Perspective**

Name of the Course : **All Undergraduate Courses except with
Chemistry Discipline**

Semester : **II**

Duration : **3 Hours**

Maximum Marks : **90**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any *six* questions.

All parts of a question should be attempted together.

Each question carries **15** marks.

1. (a) Differentiate between flavours and fragrances.
- (b) How are fragrances classified ? Explain using a fragrance wheel showing the inferred relationships among olfactory groups based upon similarities and differences in their odour.
- (c) What are the primary features a molecule must possess to exhibit sensory activity ?

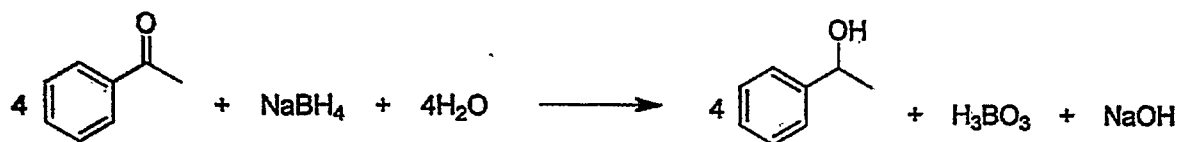
5,5,5

P.T.O.

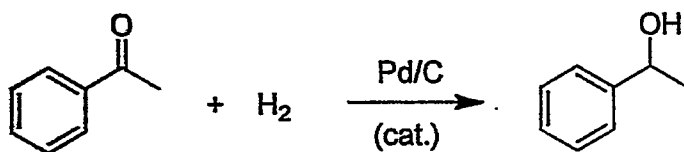
2. (a) Write short notes on the following :
- (i) Chypre Family
 - (ii) Fougere Family.
- (b) The Indian fragrance industry is one of the largest in terms of production, consumption and at present. the fragrance market is set to grow and offer innumerable opportunities for new entrants to grow in this market. Explain.
- (c) What is a perfume concentr  te ? Which are the raw materials commonly used in formulation of perfumes ? 5,5,5
3. (a) Identify the following :
- (i) First female perfume maker.
 - (ii) Secretion of the bile duct in the intestines of the sperm whale, and can be found floating on the sea or washed up on coastlines.
 - (iii) Earliest perfumery material to be produced industrially, prepared from toluene in 1866.
 - (iv) The main centre of Attar production in India.
 - (v) The Egyptian traditional temple incense.
- (b) Establish the differences between an alcohol and oil based perfumes.
- (c) What are the different essential oil extraction methods used in perfumery ? Explain the green method used for extraction of *d*-limonene from orange peels. 5,5,5

4. (a) Discuss the role of green chemistry in sustainable perfumery.
- (b) Define Atom Economy. Calculate the atom economy for each of the routes involved in the synthesis of secondary alcohol.

Route-1



Route-2



Atomic masses :

$$\text{C} = 12, \text{H} = 1, \text{O} = 16, \text{Na} = 23, \text{B} = 11$$

- (c) Justify the statement : "Use of auxiliary substances be made unnecessary wherever possible and innocuous when used". 5,5,5
5. (a) Discuss biotechnology as a source of natural flavours.
- (b) Define "Flavour" and "Flavouring Agent". Also, give the names of any two flavouring agents along with their respective raw materials. 10,5
6. (a) Stability of food flavours is a complex issue. Explain by giving the chemical interactions involved.
- (b) Write down the structure of *Amadori rearrangement product* and give its significance as flavour precursor. 10,5

P.T.O.

7. (a) What do you mean by the term "Flavour Modifiers" ? Explain by giving examples.
- (b) Explain 'Triangle' test for sensory evaluation of flavours. 10,5
8. (a) Write short notes on the following extraction techniques :
- (i) Adsorption
- (ii) Hydro distillation.
- (b) Why different percentage of eugenol, a flavouring substance from clove bud is obtained from steam distillation compared with liquid CO₂ extraction method ? Explain. 10,5