



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**DEPARTMENT OF PURE AND APPLIED SCIENCES**  
**2024 1 EXAMINATION**

**COURSE CODE: CHM 312**

**COURSE TITLE: INDUSTRIAL CHEMICAL PROCESSES 1**

**INSTRUCTION: Answer question 1 and any other 2 questions**

**CREDIT UNIT: 2**

**TIME: 2 HRS**

**Question 1**

- a) With the help of equation, explain what happens to urine when exposed to the air in open vessels for several days. **6mks**
- b) What are the unit operations involved in a fermentation product recovery and purification? **5mks**
- c) Define wine aging. **2mks**
  - i. Name the wine aging methods and state the most important factor that is responsible to the character of a wine. **8mks**
  - ii. Draw the structure of tetracycline and give reason while a batch process is best in the manufacture of tetracycline. **4mks**
- d) In two sentences only, summarize the production process of dyes. **5mks**

**Question 2**

- a) Classify polymers on the bases of molecular forces present in them and give a brief explanation of each class. **8mks**
- i) Summarize the two main types of flavoring agents. **12mks**

**Question 3**

- a) Give examples of 8 volatile oils used as flavoring agents; **8mks**
- b) Summarize the low pressure production process of HDPE/ LDPE. **12mk**

**Question 4**

- a) Name the process used in the production of solution SBR **2mks**
- b) Describe the production of methyl salicylate as a flavoring agent. **8mks**
- c) Describe five characteristics of explosives. **10mks**

**Question 5**

- a) State one use of the following adhesives? **(4 marks)**
- b) Describe the methods of applying pesticides. **(7 Marks)**

5ci. Write short notes on Separation of Terpenoids from essential oil. **(5 Marks)**

5cii. State the general properties of terpenoids. **(4 Marks)**