



NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
2025_1 EXAMINATION...

COURSE CODE: CHM 304

COURSE TITLE: Colour Chemistry

COURSE UNIT: 2 units

TIME: 2 hours

INSTRUCTION: Answer question 1 and any other 2 questions

Question 1

- (a) Outline the seven (7) colours of visible spectrum in the appropriate order. (3.5 marks)
- (b) Describe why green leaf appear to be green based on colour perception (6 marks)
- (c) State any five (5) limitations of natural pigments. (5 marks)
- (d) With suitable examples, give a brief description of auxochromes (4.5 marks)
- (e) What are the three (3) features that made cationic direct dyes suitable for application in the paper industries? (3 marks)
- (f) Explain the basic features to consider when differentiating the type of dyeing machine. (4 marks)
- (g) Enumerate the basic selection criteria of colourants for agriculture industry. (4marks)

Question 2

- (a) Discuss any four (4) of the following categories of natural dyes with special emphasis on source, extraction process and colour they produced:
 - (i) Madder (ii) Woad (iii) Indigo (iv) Cochineal (v) Ochre. (12 marks)
- (b) Differentiate between organic and inorganic pigments based upon the following two principal factors: (i) Molecular structure of the pigments (ii) Exposure (8 marks)

Question 3

- (a) Distinguish between a mordant and mordant dyes. Give two (2) examples of each. (6 marks)
- (b) Identify the four (4) classes of fibers based on their origin. (4 marks)
- (c) Discuss the dyeing process of leather or leather products. (6 marks)
- (d) Differentiate between additive and subtractive primary colours (4marks)

Question 4

- a) What are the four (4) fundamental dyeing patterns that have found application in dyeing industry? (8 marks)
- b) Discuss explicitly the two (2) main categories of metallic pigments and state their applications. (12 marks)

Question 5

- (a) Outline any five (5) technical features of High Temperature High Pressure Soft Flow Dyeing Machine. (5 marks)
- (b) How is polyethylene different from polypropylene? (15 marks)