

**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**DEPARTMENT OF PURE AND APPLIED SCIENCES**

 **APRIL/MAY, 2019 EXAMINATIONS**

**COURSE CODE:** CHM 304 **CREDIT UNIT:** 2

**COURSE TITLE: Colour chemistry and technology**  **TIME:** 2 HRS

**INSTRUCTION: *Answer question 1 and any other 3 questions***

**Question 1**

1 (a) Define colour **(2 marks)**

 (b) Name the primary colours that are needed to produce the following secondary colours:

 Violet; Black: **(2 marks)**

(c) Write the structures of Betalian pigment **(2 marks)**

(d) Give 3 key features of organic pigments **(3 marks)**

(e) What are auxochromes? **(2 marks)**

(f) List three grades of paper that can be dyed **(3 marks)**

(g) What are natural dyes **(2 marks)**

(h) List three dyeing materials **(3 marks)**

(i) Write short note on polyvinyl chloride (**3 marks)**

(j) Give three applications of poly urethane **(3 marks)**

**TOTAL MARK: 25 MARKS**

**Question 2**

2(a) Outline 5 characteristics features of polyamide (nylon) ***5 marks***

(b) Write the balance equation to show the synthesis of polypropylene from the monomer propylene ***4 marks***

(c) With the aid of chemical structure define each of these

Isotactic polypropylene **3 marks**

Atactic polypropylene  **3 marks**

**TOTAL MARK: 15 MARKS**

**Question 3**

3. (a) Give a list of three types of pigments you know **3 marks**

 (b) Enumerate five limitations of natural pigments **8 marks**

 (c) Define pigment **2 marks**

 (d) List four factors that affect the choice of pigment **2 marks**

**TOTAL MARK: 15 MARKS**

**Question 4**

4 (a) What is dye? **2 marks**

 (b) In a tabular form, discuss the differences between dyes and pigment under the following

 headings. Solubility, product resistance, chemical composition, Imparting of colours and

 structure during the application process ***10 marks***

 (c) List 3 important applications of pigments **3 marks**

 **TOTAL MARK: 15 MARKS**

**Question 5**

5 (a) List 4 different types of natural fibers **4 marks**

 (b) Discuss the extraction of fibers **9 marks**

 (c) What are secondary colour **2 marks**

**Total 15marks**