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**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**University Village, Nnamdi Azikiwe Expressway, Plot 91, Cadastral Zone, Jabi, Abuja**

**FACULTY OF SCIENCES**

**DEPARTMENT OF PUREAND APPLIED SCIENCE**

**JULY 2018 EXAMINATION**

**COURSE CODE: CHM 304**

**COURSE TITLE: Colour Chemistry**

**COURSE UNIT: 2 units**

**TIME: 2 hours**

**INSTRUCTION: Answer *Question one (1)* and *any other three (3) questions***

***Question 1***

1. (a) Define each of the following terms

 (i) Electromagnetic Spectrum (ii) Pigment [4 Marks]

 (b) Explain each of the following terms:

 (i) Absorption (ii) Transmission (iii) Refraction [6 Marks]

 (c) State three factors that affects the selection of pigments [3 Marks]

 (d) List three applications of aluminum pigments [3 Marks]

 (e) State the repeated units for each of the following polymers

 (i) Cellulose (ii) PVC (iii) Polyurethane [3 Marks]

 (f) What are the special features of hank dyeing machine [3 Marks]

 (g) What are the significant features of Pad Batch dyeing process [3 Marks]

***Question 2***

. (a) (i) What are three types of pigment [3 Marks]

 (ii) Differentiate between natural and synthetic organic pigments [2 Marks]

 (b) Mention three limitations of natural pigments [3 Marks]

 (c) State three key characteristics of organic pigments [3 Marks]

 (d) Give four reasons why inorganic pigments are considered better than their organic

 counterparts. [4 Marks]

***Question 3***

 (a) Define the term dyes. [2 Marks]

 (b) Explain briefly the application of dyes and pigments in each of the following industries:

 (i) Agricultural Industry [2 Marks]

 (ii) Security Printing Industry [2 Marks]

 (iii) Cosmetic Industry [2 Marks]

 (c) What are the different ways of classifying dyes? [3 Marks]

 (d) Explain the two groups of natural fibres [4 Marks]

***Question 4***

4. (a) Define each of the following terms:

 (i) Mordant

 (ii) Mordant dyes [4 Marks]

 (b) State

 (i) Four classes of fibres based on their origin. [2 Marks]

 (ii) Two natural sources of fibres [2 Marks]

 (c) Explain briefly the dyeing process of leather [4 Marks]

 (d) Explain briefly three dyeing patterns [3 Marks]

***Question 5***

5. (a) Write short note on each of the followings:

 (i) Spandex

 (ii) Cellulose [6 Marks]

 (b) State four types of dyeing processes [2 Marks]

 (c) (i) Describe the operation of a Beam Dyeing Machine [3 Marks]

 (ii) What are the features of Beam Dyeing Machine [2 Marks]

 (d) (ii) State the feature effects of violet colour [2 Marks]