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**University Examinations 2016/2017**

FOURTH YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE CHEMISTRY

**SCH 2412: NATURAL PRODUCTS CHEMISTRY**

**DATE: December, 2016 TIME: HOURS**



**INSTRUCTIONS:** *Answer questions* ***one*** *and any other* ***two*** *questions .*

**QUESTION ONE - (30 MARKS)**

1. Define the following terms; (3 Marks)
2. Bioassay
3. Natural products
4. Pharmacognosy
5. State the pharmacological activities associated with the following alkaloids; (4 Marks)
6. Quinine
7. Morphine
8. Nicotine
9. Cocaine
10. Name four methods used in the purification of natural products isolated compounds.

(4 Marks)

1. Outline the advantages of extraction of terpenoids from plant material with super critical liquids over the traditional solvent extraction methods. (6 Marks)
2. State and explain two spectroscopic techniques employed in structural characteristics of an isolated natural product. (4 Marks)
3. (i) What are steroids? (2 Marks)

(ii) Give three examples of steroids. (3 Marks)

1. Briefly describe how the nature of nitrogen atom in alkaloids can be qualitatively be determined. (4 Marks)
2. Distinguish between synergistic and antagonistic activity of isolates of natural products.

(2 Marks)

**QUESTION TWO (20 MARKS)**

1. (i) Name three aspects considered during purity evaluation in quality control of natural products herbal formulation. (3 Marks)

(ii) Name two analytical methods employed in establishing the constant composition of herbal preparation. (2 Marks)

1. Briefly describe the procedure on how detection of an isolated compound is carried out in the laboratory. (4 Marks)
2. Give a brief discussion of **flavonoids** under the following sub headings;
3. Structure (1 Mark)
4. Occurrence (1 Mark)
5. Classifications (3 Marks)
6. Stages of biosynthetic pathway (1½ Marks)
7. Physiological activities (1½ Marks)
8. State three reasons as to why separation of pure state compounds from natural sources involve laborious and elaborate processes. (3 Marks)

**QUESTION THREE (20 MARKS)**

1. State industrial uses of medicinal plants. (4 Marks)
2. State three disadvantages associated with synthetic drugs. (3 Marks)
3. Discuss **nicotine** under the following subheadings;
4. Structure (1 Mark)
5. Physiological effects (2 Marks)
6. Synthesis (6 Marks)
7. Uses of nicotinic acid (2 Marks)
8. (i) What are tannins? (1 Mark)

(ii) How are tannins classified? (1 Mark)

**QUESTION FOUR (20 MARKS)**

1. (i) What are anthocyanins? (1 Mark)
2. Name three classes of anthocyanins. (1 ½ Mark)
3. State three roles played by secondary metabolites in plant life. (3 Marks)
4. Biological assay of natural products is done to evaluate three properties. Name the properties. (1½Mark)
5. Distinguish between *in vivo* and *in vitro* evaluation. (2 Marks)
6. Briefly discuss **cholesterol** under the following subheadings;
7. Structure (2 Marks)
8. Occurrence (2 Marks)
9. Human bodily function (2 Marks)
10. Effect and control of its excessive deposition in the human body. (4 Marks)
11. Name the vitamins associated with the following condition;
12. Ricket (½ Mark)
13. Cancer (½ Mark)