

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

SECOND SEMESTER EXAMINATION

CH321 – MEDICINAL CHEMISTRY AND NATURAL PRODUCTS

MONDAY 31<sup>ST</sup> OCTOBER 2022 8:20 AM

**TIME ALLOWED: 2 HOURS**

**INFORMATION FOR CANDIDATES:**

1. You will have 10 minutes to read the question paper. You **MUST NOT** begin writing in the answer book during this time.
2. **ANSWER ALL QUESTIONS.**
3. All answers **MUST** be written on the answer book provided
4. Calculators are permitted in the examination room. Lecture notes, notebooks plain papers and textbooks are **NOT** allowed.
5. Mobile phones are not allowed. **SWITCH OFF THE MOBILE PHONES.**
6. Show all workings and calculations in the answer book.
7. **DRAW the STRUCTURES** clear and visible.
8. **DO NOT** over write.
9. Write your name and number clearly on the front page. **DO IT NOW.**

**MARKING SCHEME:** Total 50 marks

1. (a) What is the isoprene rule? [2 marks]
- (b) Describe the extraction method for essential oils. [2 marks]
- (c) Outline any THREE reactions for the structural elucidation of myrcene. [6 marks]
- (TOTAL = 10 MARKS)**
2. (a) State the MAIN difference between cholesterol and ergosterol? [2 marks]
- (b) Steroids, in general, have 6 chiral carbon centers. Calculate the number of possible isomers for steroids. [3 marks]
- (c) Describe the general extraction method for lipids such as cholesterol. [2 marks]
- (TOTAL = 7 MARKS)**
3. (a) In at least TWO sentences, describe the MAIN property of tannins. [4 marks]
- (b) State the industrial use of tannins associated with this property in 3a. [1 mark]
- (c) Highlight the MAIN difference between the structure of catechin and epicatechin. [4 marks]
- (d) Outline the hydrolysis reaction products of ellagitannins. [6 marks]
- (TOTAL = 15 MARKS)**
4. (a) Discuss with an illustration, the surfactant property of saponins. [8 marks]
- (b) State ONE use of saponin associated with this property. [2 marks]
- (TOTAL = 10 MARKS)**
5. (a) Give reasons why stereospecificity is important in drug metabolism? [2 marks]
- (b) (S) (+)- Naproxen sodium is active compared to its (R) (-)- isomer. Explain why this is so, using the Easson-Stedaman hypothesis. [4 marks]

- (c) Discuss the MAIN advantage of parenteral administration over oral administration, in relation to bioavailability of drugs. [2 marks]

**(TOTAL = 8 MARKS)**

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