

**NATIONAL UNIVERSITY OF LESOTHO**

**B.SC. PHARMACY**

**SUPPLEMENTARY EXAMINATIONS**

**PHA 411 – PHARMACEUTICAL CHEMISTRY**

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**JULY 2009**

**MARKS: 100**

**TIME: 3 HOURS**

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**INSTRUCTIONS:**

**Answer ALL questions.**

**Answer each question on a new page.**

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ANSWER ALL QUESTIONS.

**QUESTION 1**

**[20]**

Provide the reactions which give rise to the following products.

- a) D,L-valine [2]
- b) Penicillamine [2]
- c) 7-aminocephalosporanic acid [3]
- d) Cephalothin [10]
- e) Epi-chlortetracycline [3]

**QUESTION 2**

**[20]**

- a) Explain, giving supporting examples, the importance or non-importance of the intact 5-ring structure of morphine for analgesic activity. [10]
- b) Show the effect of substitution on the antibacterial activity of penicillins. DO NOT include adjustments to the nucleus. [10]

**QUESTION 3**

**[20]**

For TWO of the following classes of compounds, give two (2) compounds, their classification, botanical sources and medicinal importance.

- a) Alkaloids [10]
- b) Isoprene derivatives [10]
- c) Anthraquinones [10]
- d) Saponins [10]

Answer only **TWO**

**QUESTION 4**

**[20]**

- a) (+)-Camphor is an important monoterpene used widely in cosmetic products. Show the synthetic pathway of this compound.
- b) Give the structural pathway showing reduced degradation of tetracyclines.

**QUESTION 5****[20]**

Suggest optimization steps for the pharmacological activities of the following compounds:

- a) Benzomorphans
- b) Chloramphenicol
- c) Quinolones
- d) Tetracyclines
- e) Benzylpenicillin