

CHEMISTRY (School Based Option – Drugs and medicines)
STANDARD LEVEL
PAPER 3

Tuesday 21 May 2002 (morning)

25 minutes

Total time for Paper 3 – 1 hour 15 minutes

Name							
Number							

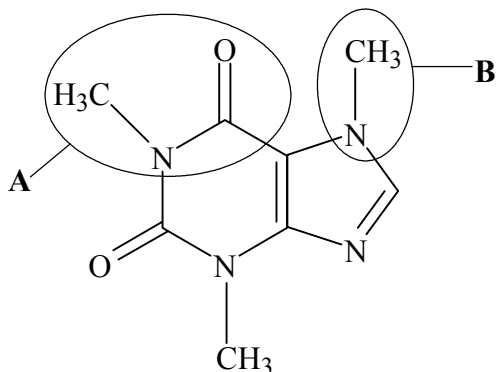
INSTRUCTIONS TO CANDIDATES

- Write your candidate name and number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions from this Option in the spaces provided. You may continue your answers in a continuation answer booklet, and indicate the number of booklets used in the box below. Write your name and candidate number on the front cover of the continuation answer booklets, and attach them to this question paper using the tag provided.

		EXAMINER	TEAM LEADER	IBCA
NUMBER OF CONTINUATION BOOKLETS USED	/15	/15	/15

School Based Option – Drugs and medicines

S1. (a) The structure of caffeine is given below with two of its functional groups circled (**A** and **B**).



Name the two functional groups circled.

[2]

Group **A**:

Group **B**:

(b) Caffeine possesses two heterocyclic rings. A heterocyclic ring contains at least one other atom apart from carbon. From the structures given in the Drugs and Medicines Data Sheet, identify which **one** of the following is **not** a heterocyclic compound: codeine, nicotine, penicillin, adrenaline.

[1]

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(c) A cup of coffee contains approximately 80 mg of caffeine. Calculate the amount (in moles) of caffeine present in 80 mg of caffeine.

[3]

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(d) The consumption of too much caffeine can lead to side-effects. One such side-effect is that it acts as a *diuretic*. State what is meant by the term *diuretic*.

[1]

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(This question continues on the following page)

(Question S1 continued)

- (e) The LD_{50} of caffeine is 13.4 g for a 70 kg human. Explain what is meant by the term LD_{50} . [1]

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- (f) Apart from coffee and tea, state **one** other substance commonly consumed by humans which contains appreciable amounts of caffeine. [1]

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S2. Morphine, a strong analgesic, is often injected intravenously. Morphine can have certain specific side-effects and users can develop tolerance towards it.

- (a) State the advantage of injecting morphine intravenously compared to other methods of administration. [1]

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- (b) State why morphine is sometimes present in medicines taken to treat diarrhoea. [1]

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- (c) Outline the difference between developing tolerance towards morphine and becoming addicted to it. [2]

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- (d) Explain why developing tolerance towards a strong analgesic can be dangerous. [2]

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