



1. Aspirin and paracetamol (acetaminophen) are mild analgesics.

(i) State **one** advantage of aspirin and **one** disadvantage of paracetamol (acetaminophen).

Advantage of aspirin:

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.....

Disadvantage of paracetamol:

.....
.....

(2)

(ii) Explain why it is dangerous to take aspirin when ethanol has also been consumed.

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.....

(1)

(Total 3 marks)

2. Morphine is a strong analgesic which is administered parenterally.

(i) State the meaning of the term *parenteral*.

.....

(1)

(ii) Explain how a strong analgesic such as morphine prevents pain.

.....
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.....
.....

(2)



- (iii) The structures of morphine and diamorphine (heroin) are shown in Table 20 of the Data Booklet. State the name of a functional group present in diamorphine (heroin) but not in morphine.

.....

(1)

(Total 4 marks)

3. Aspirin, paracetamol (acetaminophen), morphine and diamorphine (heroin) are all pain killers. Their structures are given in Table 20 of the Data Booklet.

- (a) Aspirin is thought to interfere with the production of prostaglandins. Explain how this produces an analgesic effect.

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.....

(1)

- (b) Explain how morphine can prevent pain.

.....

.....

(1)

- (c) Paracetamol (acetaminophen) is generally considered to be safe to use as an analgesic in small doses. Other than the possibility of death, outline the problems associated with taking larger doses of paracetamol.

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(2)

- (d) State **one** important use for aspirin other than the relief of pain and fever.

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(1)



(e) Other than the phenyl group, state the name of **one** other functional group that is common to

(i) both paracetamol and morphine.

.....

(1)

(ii) both aspirin and diamorphine.

.....

(1)

(Total 7 marks)

4. Suggest a reagent that could be used to convert morphine into diamorphine and state the name of the type of reaction taking place.

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.....

(Total 2 marks)



5. State the differences between the structures of morphine and diamorphine (heroin). State the names of all functional groups in the molecule of morphine.

Differences:

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.....

Functional groups:

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.....
.....

(Total 3 marks)

6. Mild analgesics such as aspirin, and strong analgesics such as opiates, differ not only in their potency but also in the ways they act on the central nervous system.

- (a) Describe how mild and strong analgesics provide pain relief.

Mild analgesics:

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Strong analgesics:

.....
.....

(2)



- (b) Discuss **two** advantages and **two** disadvantages of using morphine and other opiates for pain relief.

Advantages:

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.....

Disadvantages:

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.....
.....

(4)
(Total 6 marks)

7. Two examples of mild analgesics are aspirin and paracetamol (acetaminophen). Paracetamol is often used as an alternative to aspirin. State **one** advantage and **one** disadvantage of the use of paracetamol.

Advantage:

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.....

Disadvantage:

.....
.....

(Total 2 marks)



8. Examples of strong analgesics are morphine, codeine and diamorphine (heroin). Their structures are shown in Table 20 of the Data Booklet.

(i) Identify **two** functional groups present in all three of these analgesics.

.....
.....

(2)

(ii) Identify **one** functional group present in morphine, but not in diamorphine.

.....

(1)

(iii) State the name of the type of chemical reaction which is used to convert morphine into diamorphine.

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(1)

(Total 4 marks)

9. Analgesics are used to relieve pain in the body. Aspirin and paracetamol (acetaminophen) are both mild analgesics.

(a) Discuss the advantages of using aspirin instead of paracetamol.

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(2)



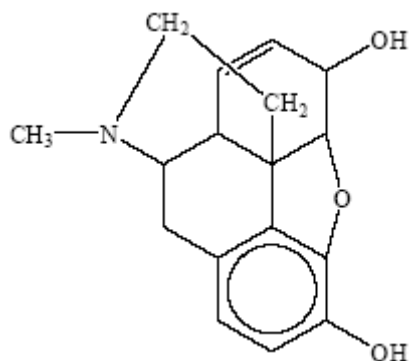
- (b) Compare how mild and strong analgesics relieve pain in the body.

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.....
.....
.....

(2)
(Total 4 marks)

10. The structures of the strong analgesics morphine and heroin (diamorphine) can be found in Table 20 of the Data Booklet.

- (i) Identify the amine functional group in the morphine molecule below by drawing a ring around it.



(1)

- (ii) Classify the type of amine present in morphine.

.....

(1)

- (iii) State the name of the functional group found in heroin but not in morphine.

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(1)
(Total 3 marks)



11. State **one** advantage and **one** disadvantage of using morphine as a strong analgesic.

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(Total 2 marks)