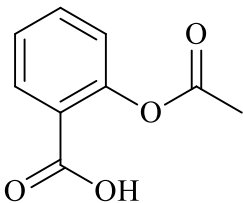
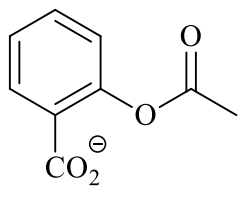
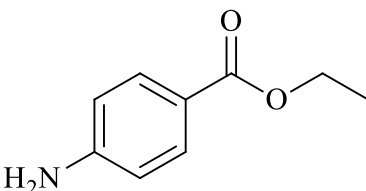
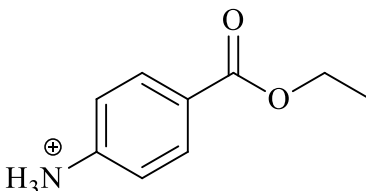


**Marks**  
**5**

- The structures of the drugs aspirin and benzocaine are shown below.
  - Draw the conjugate base of aspirin and the conjugate acid of benzocaine.
  - Circle the form of each that will be present in a highly acidic environment.

 aspirin	 conjugate base of aspirin
 benzocaine	 conjugate acid of benzocaine

Ions are less likely to cross cell membranes than uncharged molecules. One of the drugs above is absorbed in the acid environment of the stomach and the other is absorbed in the basic environment of the intestine. Identify which is absorbed in each environment below and *briefly* explain your answers.

Drug absorbed in the stomach:

aspirin / benzocaine

Drug absorbed in the intestine:

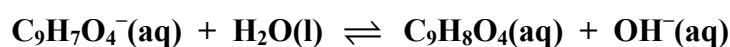
 aspirin / benzocaine

**Aspirin is absorbed in the stomach as it remains in the neutral uncharged form in the acidic environment.**

**Benzocaine is absorbed in the intestine as it remains in the neutral uncharged form in the basic environment.**

Aspirin,  $C_9H_8O_4$  is not very soluble in water. “Soluble aspirin”, the sodium salt  $NaC_9H_7O_4$ , is often administered instead. Is a solution of “soluble aspirin” acidic or basic? Briefly explain your answer.

**Basic. The  $C_9H_7O_4^-(aq)$  ion reacts with water (*i.e.* undergoes hydrolysis) to generate a small amount of  $OH^-(aq)$  ions. The  $C_9H_7O_4^-(aq)$  ion is a weak base, so the following equilibrium reaction lies very much in favour of the reactants.**



**THIS QUESTION CONTINUES ON THE NEXT PAGE.**