1. Outline what is meant by the term *synergistic effect* of ethanol using a suitable example.

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(Total 2 marks)

2. Fluoxetine hydrochloride (Prozac®) is a common depressant. Depressants have many therapeutic uses.

(a) State **three** other common depressants.

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(3)

(b) Describe **one** effect, other than relieving depression, of moderate doses of depressants on patients.

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(1)

(Total 4 marks)

3. Describe the effect on the individual of consuming depressants at moderate and high doses.

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(Total 2 marks)

4. One problem associated with ethanol consumption is an increased risk of traffic accidents. Police in many countries use a breathalyser to test drivers. The breathalyser contains potassium dichromate(VI).

(i) Describe the colour change of potassium dichromate(VI) when it reacts with ethanol.

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(1)

(ii) State with a reason whether chromium in potassium dichromate(VI) is oxidised or reduced by ethanol.

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(1)
(Total 2 marks)

5. Ethanol, a depressant, is sufficiently volatile to pass into the lungs from the bloodstream. The roadside breathalyser test uses acidified potassium dichromate(VI) which reacts with any ethanol present in the breath and converts it to ethanoic acid.

(a) (i) State the oxidation and reduction half-equations that occur in the breathalyser when ethanol is present in the breath.

Oxidation:

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Reduction:

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(2)

(ii) Describe the colour change that occurs to the acidified dichromate(VI) if ethanol is present in the breath.

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(1)

(b) Police use the intoximeter, an infrared spectrophotometer to confirm a roadside breathalyser test. Explain how the amount of ethanol is determined from the infrared spectrum.

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(2)

(Total 5 marks)

6. Suggest why it is advisable not to drink alcohol when taking other drugs.

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(Total 2 marks)

7. (a) One method for detecting ethanol in breath involves blowing through a tube containing crystals of potassium dichromate(VI). The ethanol turns the crystals from orange to green.
Explain what happens to both the dichromate(VI) ion and the ethanol in this reaction.

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(2)

(b) A modern method for accurately determining the amount of ethanol in breath uses an intoximeter. Describe how an intoximeter works.

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(3)

(Total 5 marks)