Answers to end-of-chapter questions
Chapter 15: Drugs

1 a A stimulant causes the activity of the brain to increase, whereas a depressant causes the activity of the brain to decrease.

b Carbon dioxide has the formula CO_2. It is a gas found in small concentrations in normal air (about 0.04%). Carbon dioxide is used by plants in photosynthesis and produced by all living organisms by respiration. It is produced when fuels are burnt.
Carbon monoxide has the formula CO. It is not found in normal air. It is not used by living organisms. It is produced when substances are burnt in an insufficient supply of air, so that they are not completely oxidised. Carbon monoxide is a toxic gas, which combines with haemoglobin and therefore reduces the quantity of oxygen that is transported to cells.

c Cirrhosis is a disease of the liver, caused by toxins such as alcohol, which damage the liver tissues.
COPD stands for chronic obstructive pulmonary disease, and is a disease of the gas exchange system. It is caused by inhaling gases such as those in cigarette smoke, which cause widespread damage to the lungs, including emphysema, in which the walls of the alveoli break down.

d Tar is a mixture of dark, oily substances in tobacco smoke. Several of the components of tar are carcinogens (they can cause cancer). Nicotine is a substance in tobacco smoke that is absorbed into the blood from the lungs and affects the brain; it is addictive.

2 a Influenza is caused by a virus. Antibiotics only destroy bacteria, not viruses.

b Cigarette smoke contains nicotine, which is an addictive drug.

c Many heroin users inject the drug. They may use a needle that has already been used by someone else. If that person was HIV positive, then there may be HIV viruses on the needle.

d Cigarette smoke contains tars. If these are breathed in by anyone – even if they are only breathing someone else's smoke – they can cause cancer.

3 a i increased from about 1300 per year to 4400 per year between 1911 and 1946;
dropped to 1500 per year by 2011;

ii rose from almost 0 in 1911 to about 27 per thousand in 1971;
then fell to about 17 per thousand by 2011. [4]

b curve for deaths from lung cancer follows similar pattern to curve for number of cigarettes smoked;
with a 25 year time lag;
idea that cancer takes time to develop;
reference to a *correlation* between number of cigarettes smoked and lung cancer deaths;
idea that correlation does not prove cause and effect; [5]

c similar pattern seen in females as in males;
suggests that the correlation is not just coincidence;
although the time lag is shorter (about 20 years);
but still does not prove cause and effect; **[max 3]**

4 a axes correctly labelled;
x-axis scale uses the ranges from the table;
good scale on both axes that uses most of the graph paper provided;
each bar drawn neatly and precisely; [4]

b the more cigarettes smoked per day, the greater the chance of dying between the ages of 40 and 60 years old;
the younger a person is when they start smoking, the greater the chance of dying between the ages of 40 and 60 years old;
the number of cigarettes smoked per day seems to increase the chance of dying between 40 and 60 more than the age at which smoking started; [3]