The following answers are based on pages 44–55:

Section one: What is cancer (pages 44–46)?

1. What part of a cell must be damaged before it becomes a cancer cell?
   
   The genetic information, DNA.

2. In what ways does a cancer cell behave differently from a normal cell?

   Cancer cells do not respond to the signals that control normal cell behaviour. They multiply uncontrollably, making many more cancer cells in the process.

3. What results from this behaviour and what can be done about it?

   The cancer cells usually grow into a lump called a tumour, which can grow to be several centimetres wide before it is detected. The tumour can be removed by a surgeon and, if the cancer has not spread to any other parts of the body, the patient can be cured.

4. Why are cancer cells more likely to be found in older people than in children?

   Cancer is more common in older people because it usually takes a cancer cell many many years to get out of control.

Section two: Risk factors in cancer development (pages 46–47)

5. List three ways in which you can help to prevent getting cancer yourself:

   (i) Do not smoke.
   (ii) Protect your skin from the sun.
   (iii) Eat fresh fruit and vegetables.
   (iv) Moderate alcohol consumption.
   (v) Women — undertake regular cervical smear tests and breast examinations.

6. Give one reason why each action is preventative:

   (i) Cigarette smoke is full of chemicals that damage your DNA.
   (ii) The harmful rays from the sun can damage the DNA of your skin and eye cells.
   (iii) Fruit and vegetables (particularly citrus fruit) contain substances that 'mop up' certain waste products of the cell that may otherwise damage DNA.
   (iv) Alcohol is linked to approximately 3% of cancer incidence, particularly in the mouth, larynx, oesophagus and liver.
(v) Regular screening ensures that a cancer is detected in the early stages, thereby increasing the chances of curing it.

Section three: Chemotherapy (pages 48–53)

7. Cancer cells multiply very rapidly, and drugs which kill multiplying cells can be used to treat cancer. This is known as ‘chemotherapy’. What other parts of the body are affected by chemotherapy?

   The drugs kill some of the normal cells that line the stomach and intestines, cells that make hair, and cells in the bone marrow.

8. Describe how someone undergoing this treatment might appear different to you.

   Pale and tired with a loss of hair.

9. From which plant was a chemical extracted for the treatment of cancer?

   The common garden plant, periwinkle.

10. What is the commonest cancer in children?

    Leukaemia.

11. If you took a sample of 200 children with this type of cancer today, how many would you expect to be cured?

    Approximately 160.

Section four: Other cancer treatments (pages 54–55)

12. There are many scientists working to find cures for all the different types of cancer. Describe briefly two ways in which we might be able to cure cancer in the future.

   (i) One prospect is vaccination. It is hoped that human defender cells (especially lymphocytes) might be made to ‘recognize’ cancer cells as unwanted intruders and destroy them. Some patients are already being injected with a harmless preparation from their own tumour cells in an attempt to encourage the production of antibodies against these cells.

   (ii) Scientists are also looking for drugs that replace or repair the mutant genes or proteins that are responsible for cancer.

   (iii) Since some cancers are dependent on the body’s normal hormones to keep on growing, ‘dummy’ hormone drugs, which block the normal hormone signalling the cancer cells, may also lead to new treatments. For example, in breast cancer, a drug called tamoxifen competes with the natural hormone oestrogen.

   (iv) The cytokines, a group of messenger molecules, may also be useful at treating cancers. Some of these molecules may be able to control the way cancer cells behave, and others may help the body’s defender cells to recognize and destroy cancer cells. Interferon is already being used to treat some of the rarer cancers.