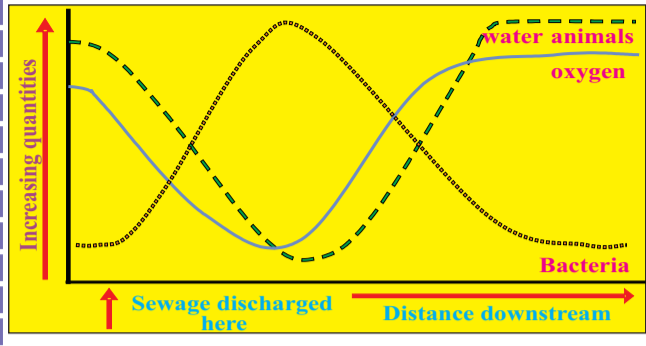


## EXAM BASED QUESTIONS

Try these

### QUESTION 1

1. Study the graph below showing some of the effects when sewage is spilled into a river and answer the questions set.



- 1.1 What happens to the amount of oxygen in the water immediately after sewage enters the river? **1**
- 1.2 What happens to the concentration of bacteria in the water immediately after sewage enters the river? Explain your answer. **3**
- 1.4 What relationship exists between the changes in oxygen levels and changes in bacterial concentration as water flows downstream? **2**
- 1.5 Use information from the graph to explain why the number of water animals decreases after the sewage discharge. **3**
- 1.6 Explain how the effect of sewage discharge reflected in the graph would be different if the sewage was discharged into a small lake. **3 (12)**

### QUESTION 2

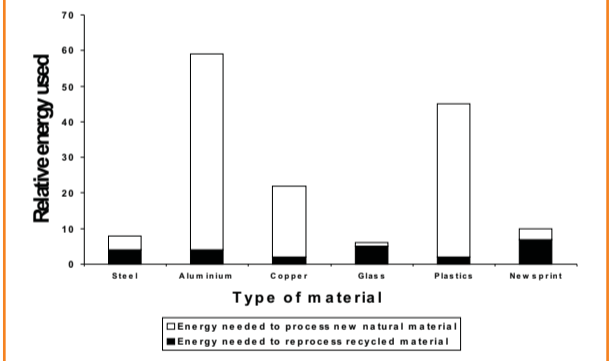
2. Study the table below showing the main sources of sulphur dioxide in South Africa.

Source of sulphur dioxide	% of total amount of sulphur dioxide
Industry	15
Domestic	8
Power Stations	50
Road Transport	24
Other	3

- 2.1 Draw a pie-chart for the above data. **12**
- 2.2 Discuss the implications of each of the following three suggestions that were put forward to overcome the high sulphur dioxide emissions from a factory:
  - (a) Shut down the factory **2**
  - (b) Move the factory out of the city **2**
  - (c) Increase the height of the factory's chimney **2 (18)**

### QUESTION 3

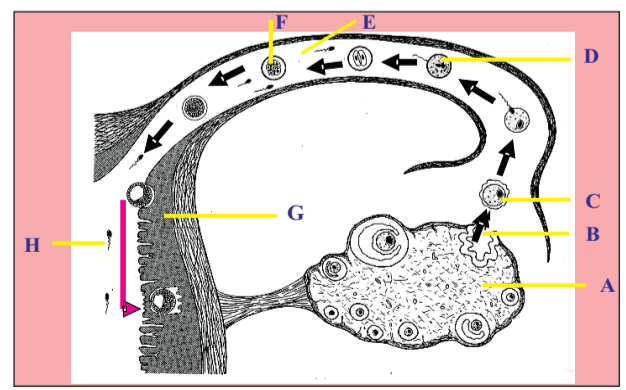
3. The bar graph below shows the relative amount of energy needed to make new natural materials compared with the energy needed to reprocess (re-cycle) these materials rather than throw them away



- 3.1 Which materials save the greatest amount of energy when reprocessed? **3**
- 3.2 Apart from saving energy, describe TWO other benefits of re-cycling materials? **2**
- 3.3 Use information from the graph to explain why it would be better to re-use rather than re-process glass products. **2**
- 3.4 Most of the materials represented in the graph are not bio-degradable. Explain what this means? **2**
- 3.5 Give TWO examples of materials that are bio-degradable. **2 (11)**

### QUESTION 4

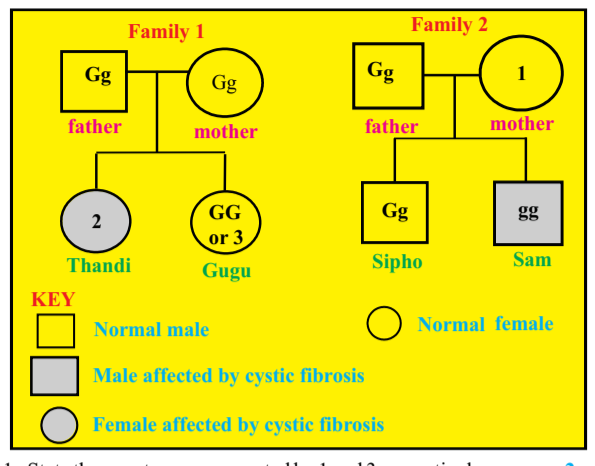
4. The following diagram represents part of the human female reproductive system after copulation. Study the diagram and answer the questions that follow.



- 4.1 Provide labels for parts A, E and G, respectively **3**
- 4.2 Name the process that takes place at B **1**
- 4.3 When during the menstrual cycle does the process mentioned in QUESTION 1.4.2 take place? **1**
- 4.4 Describe the process represented by D. **3**
- 4.5 State the number of chromosomes that would be present in the nucleus of: a) cell C b) one cell of F c) cell H **3 (11)**

### QUESTION 5

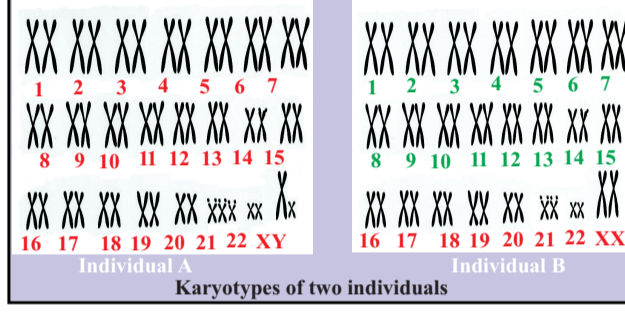
1.5 Cystic fibrosis is an inherited disorder of the human body caused by a recessive gene. This disorder affects mucus production, causing blockage of tiny air passages in the lungs. Study the following pedigree diagrams and answer the questions that follow.



- 5.1 State the genotypes represented by 1 and 3 respectively. **2**
- 5.2 What is Thandi's genotype? **1**
- 5.3 Does Thandi suffer from cystic fibrosis? **1**
- 5.4 Thandi and Sipho intend getting married. Show, using a pedigree diagram and the key above, all the possible genotypes of any sons they might have. **4**
- 5.5 Explain what Thandi and Sipho should consider before deciding whether to have children or not. **3 (11)**

### QUESTION 6

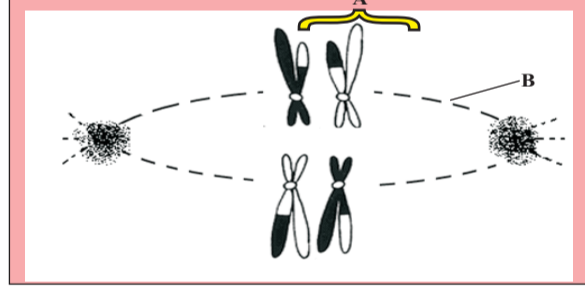
1.6 The diagrams below show the sets of chromosomes (karyotypes) in two human individuals, A and B. Study the diagrams and answer the questions that follow.



- 6.1 Which individual (A or B) is female? **1**
- 6.2 Give a reason for your answer in QUESTION 1.6.1 above. **2**
- 6.3 Identify which individual (A or B) has an abnormal number of chromosomes. **1**
- 6.4 Name the genetic disorder that the individual in QUESTION 1.6.3 has. **1**
- 6.5 Account for the abnormal chromosome number of the disorder named in QUESTION 1.6.4. **2 (7)**

### QUESTION 7

7.1 The following diagram represents a phase of meiosis. Study the diagram and answer the questions that follow.



- 7.1.1 Write down the term that describes the paired chromosomes labelled A. **1**
- 7.1.2 Identify the structure labelled B. **1**
- 7.1.3 What phase of meiosis is represented in the diagram above? **2**
- 7.1.4 How many chromosomes are shown in the diagram above? **1**
- 7.1.5 How many chromosomes would there be in each cell at the end of meiosis? **1**

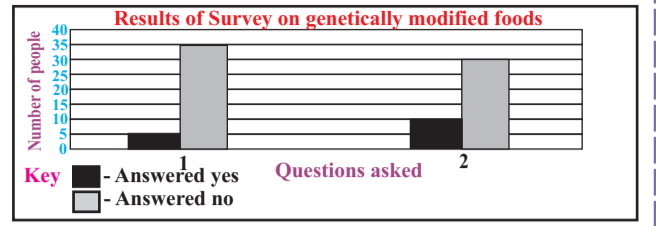
7.2 Read the following passage and answer the questions that follow

**Preformation and epigenesis theories**  
In the seventeenth century, scientists believed in the preformation theory. One group of scientists believed that the egg cell contained a miniature human being that was completely formed. This group was called the ovisists. Another group of scientists were called spermists, because they believed that a miniature human being was found in a sperm cell. Many of the ovisists and spermists reported seeing the completely formed miniature human being inside the sex cells. The preformation theory was believed for almost 200 years. As equipment for microscopy improved, the theory of epigenesis became widely accepted. In epigenesis, it is believed that an embryo develops from a zygote. The theory of epigenesis is still accepted today.

- 7.2.1 What can we learn from this passage about the way scientific knowledge develops? **2**
- 7.2.2 Why do you think scientists believed in the preformation theory in the 17th century? **2**
- 7.2.3 What evidence from the passage rejects the preformation theory? **2**
- 7.2.4 What evidence from your current knowledge would you use to reject the preformation theory? **2**

7.3 A group of Gr 12 learners carried out a survey about genetically modified (GM) foods. They used the following two questions in their survey:

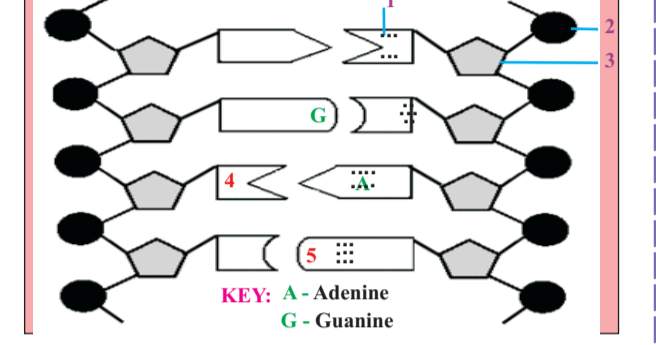
1. Are GM foods better than normal foods?
  2. Are you aware of any dangers using GM foods?
- The results of the survey are shown in the bar graph. Study the graph and answer the questions that follow.



- 7.3.1 Explain what is meant by GM foods? **2**
- 7.3.2 State TWO advantages of genetic modification for food production. **2**
- 7.3.3 How many people participated in the survey? **1**
- 7.3.4 Draw up a table to show the results of the survey. **6**
- 7.3.5 Suggest TWO ways in which the learners could make certain that the results of the survey are reliable. **4**
- 7.3.6 State ONE conclusion that could be made from the survey. **1 (30)**

### QUESTION 8

8.1 The following diagram represents a portion of a molecule. Study the diagram and answer the questions that follow.

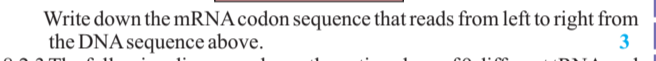


- 8.1.1 Identify the molecule referred to above. **1**
- 8.1.2 Provide labels for the parts numbered 1 and 5. **2**
- 8.1.3 What is the collective name for the parts numbered 2, 3 and 4? **1**
- 8.1.4 What is the significance of this molecule being able to replicate itself? **2**

8.2 The following questions are based on protein synthesis.

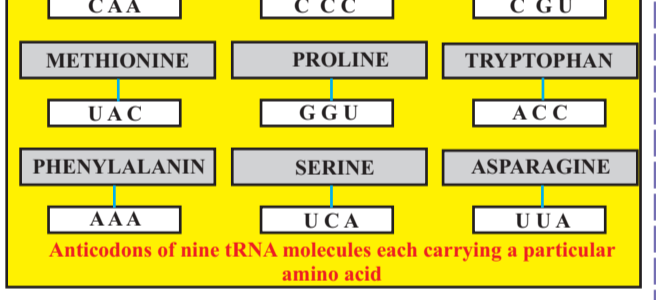
- 8.2.1 Describe each of the following: a) Transcription **2**  
b) Translation **2**

8.2.2 The following diagram shows the sequence of nitrogenous bases of a strand of DNA which codes for part of a protein molecule.



Write down the mRNA codon sequence that reads from left to right from the DNA sequence above. **3**

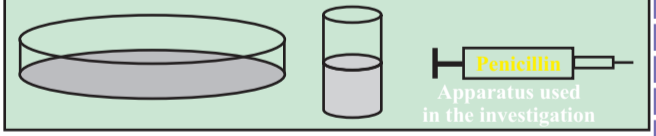
- 8.2.3 The following diagrams shows the anti-codons of 9 different tRNA each carrying a particular amino acid.



Select and write down from the diagram above the amino acids (in the correct sequence) that would be required for the base sequence of mRNA shown on the right. **3**

8.3.3 Antibiotics work by interfering with various stages of protein synthesis in a bacterial cell. A group of Gr 12 learners wanted to test the effect of the antibiotic penicillin on the bacteria *Staphylococcus aureus*. They were provided with the following apparatus:

1. Petri dishes containing agar (agar supports bacterial growth) [A]
2. Culture of *Staphylococcus aureus* [B]
3. The antibiotic penicillin [C]



List the steps that you would follow to determine the effect of the antibiotic penicillin on the bacteria *Staphylococcus aureus*. **4 (20)**

### QUESTION 9

9.1 Study the following letter to the editor of a newspaper concerning abortion.

**FOETUS IS A BABY**  
The biggest lie of the abortion industry is that the unborn child is a worthless, disposable blob of tissue. The second lie is that it is acceptable to ruthlessly terminate this life, simply because it will be an inconvenience. More than 85 000 babies were aborted in South Africa last year, bringing the total number of abortions since legalisation of abortion on demand, to more than half a million since 1997. These statistics indicate that abortion on demand is being used as a heartless form of birth control. No wonder that baby/child abuse and murders have increased. The only difference between abortion and murder victims is that one has been born while the other is supposedly in the safety of the mother's womb. Abortion, which places little value on human life, breeds a society that is heartless, especially towards its most vulnerable citizens. Source: 'Daily News' 7 June 2006

You are required to respond to this letter by addressing the following points:

- a) Choose a position that is either for or against abortion and discuss at least FOUR reasons to support your viewpoint. **8**
- b) Some people use abortion to get rid of an unwanted offspring. Describe TWO methods that they could have used to prevent pregnancy in the first place. **4**  
Synthesis **3 (15)**