



Leave  
blank

**SECTION A**

**Answer any THREE questions in this section.**

**If you answer Question 1, put a cross in this box .**

1. (a) Describe the process of mitosis that occurs during nuclear division.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

**(8)**

(b) (i) In which organs does meiosis occur in humans?

.....  
.....

**(2)**



Leave blank

(ii) Nuclear division can be either by mitosis or by meiosis. Describe **two** ways in which the daughter cells produced by these methods differ.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)

(c) Sometimes cell division results in a mutation occurring.

(i) State **two** factors that may increase the risk of mutations occurring.

.....  
.....  
.....

(2)

(ii) Explain what a mutation is and why some mutations have harmful effects.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)

(Total 20 marks)

Q1

--	--



Leave  
blank

If you answer Question 2, put a cross in this box  .

2. (a) (i) Explain what is meant by a reflex action and why reflexes are important to the body.

.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)

- (ii) Use a large labelled diagram to show the nerve pathway of the withdrawal reflex.

(8)



Leave  
blank

(b) (i) Explain why damage to the vertebral column in the neck region sometimes results in a loss of feeling and paralysis of the legs, even though there is no damage to the leg muscles.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(6)

(ii) Suggest why such damage is frequently permanent.

.....  
.....  
.....  
.....  
.....

(2)

Q2

(Total 20 marks)



Leave  
blank

If you answer Question 3, put a cross in this box  .

3. (a) (i) With the help of a large labelled diagram, explain how the forearm is raised at the elbow joint.

.....  
.....  
.....  
.....

(8)

- (ii) Describe how the range of movement at the shoulder joint is greater than at the elbow joint.

.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)



Leave  
blank

(b) (i) During exercise energy is needed by muscle cells. Describe the processes by which energy is released in a muscle cell.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)

(ii) During vigorous exercise, energy demand over a short time can lead to the formation of lactic acid. Describe the process that produces lactic acid and how the lactic acid is destroyed.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)

(Total 20 marks)

Q3

--	--

7

Turn over



N 3 5 9 1 3 A 0 7 2 0

Leave  
blank

If you answer Question 4, put a cross in this box  .

4. (a) (i) Describe the relationship between blood plasma, tissue fluid and lymph.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)

(ii) Describe the functions of each of these fluids.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(6)





Leave blank

(b) (i) During vigorous exercise both the pulse rate and blood pressure usually rise significantly. Explain why this is important to the muscles of the body.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)

(ii) Suggest possible dangers of permanently raised blood pressure.

.....  
.....  
.....  
.....  
.....  
.....

(3)

(iii) Suggest what actions a doctor might advise a patient to take to reduce dangerously high blood pressure.

.....  
.....  
.....  
.....  
.....  
.....

(3)

(Total 20 marks)

Q4



Leave  
blank

If you answer Question 5, put a cross in this box  .

5. (a) (i) Describe the structure of the human urinary system.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(5)

(ii) Explain how the kidney regulates the composition and concentration of the blood.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(6)



Leave  
blank

(b) In each of the following situations, explain why the composition and concentration of the urine varies.

(i) On a hot day with very little water to drink

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(5)

(ii) After eating a meal rich in protein

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(4)

(Total 20 marks)

Q5

**TOTAL FOR SECTION A: 60 MARKS**



Leave  
blank

**SECTION B**

**Answer any TWO questions in this section.**

**If you answer Question 6, put a cross in this box  .**

6. (a) Explain why, for the health of a community, it is important that sewage does not come into contact with the water supply.

.....  
.....  
.....  
.....  
.....  
.....

**(3)**

- (b) What are the likely effects if untreated sewage enters a lake or river?

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

**(7)**





Leave  
blank

If you answer Question 7, put a cross in this box ☒ .

7. (a) Describe **two** ways in which fungi differ from bacteria in structure.

.....  
.....  
.....  
.....

(2)

(b) Describe **two** ways in which fungi obtain their nutrients.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(6)



Leave blank

(c) Describe how the transmission of athlete's foot from person to person can be prevented and how this condition can be treated.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(5)

(d) Describe how fungi are of use to humans.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(7)

(Total 20 marks)

Q7



Leave  
blank

If you answer Question 8, put a cross in this box  .

8. (a) (i) Use a large labelled diagram to show the structure of a virus.

(3)

(ii) Describe how the reproduction of a virus is brought about.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(6)





Leave  
blank

(iii) Describe **three** ways in which viruses differ from bacteria.

.....  
.....  
.....  
.....  
.....

(3)

(b) (i) Poliomyelitis (polio) can be prevented by the use of a vaccine. Explain how a vaccine can help the body to develop immunity to a disease, such as polio.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(5)

(ii) Describe how a patient who shows symptoms of polio can be treated.

.....  
.....  
.....  
.....  
.....

(3)

(Total 20 marks)

Q8



If you answer Question 9, put a cross in this box  .

9. (a) (i) Describe how humans depend on green plants for their supplies of oxygen and energy.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**(6)**

(ii) Suggest how chemicals used in the environment, such as weedkillers, can also accumulate in the body of a human.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**(4)**



Leave  
blank

- (b) (i) Sulphur dioxide is a major pollutant in the atmosphere. Describe how this gas comes to be present in the air and the effects it has on humans and on the environment.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(5)

- (ii) The concentration of many pollutants, such as sulphur dioxide and carbon dioxide, appears to be increasing. Suggest reasons for this increase and some of the measures that could be taken to reduce it.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(5)

(Total 20 marks)

Q9

**TOTAL FOR SECTION B: 40 MARKS**

**TOTAL FOR PAPER: 100 MARKS**

**END**



**BLANK PAGE**

