

# Edexcel IGCSE(9-1) Biology

## Specification Based Exam Questions

### Section 1: The nature and variety of living organisms

This resource is to help you gain exam technique as well as understand what is needed to develop your answers to nearly all the points of the specification. You should use this in conjunction with other revision practices.

Good luck!

# 1 The nature and variety of living organisms

1.1 understand how living organisms share the following characteristics:

- they require nutrition
- they respire
- they excrete their waste
- they respond to their surroundings
- they move
- they control their internal conditions
- they reproduce
- they grow and develop.

Living organisms share some basic characteristics.

Draw a straight line from each characteristic to its correct description.

The first has been done for you.

(4)

## Characteristic

## Description

sensitivity

production of new organisms

respiration

respond to the surroundings

excretion

taking in of food

reproduction

increase in number of cells

growth

release of energy in cells

nutrition

removal of metabolic waste

**(Total for Question = 4 marks)**

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**1.2 describe the common features shown by eukaryotic organisms: plants, animals, fungi and protocists**

(a) The table shows features found in three groups of living organisms.

Complete the table using a tick (✓) to show that the group of living organisms shows the feature and a cross (✗) if the feature is absent.

(4)

Group	Feature			
	Cell wall	Plasmid	Cytoplasm	Nucleus
bacteria			✓	
fungi				✓
protocists	✗	✗		

(b) Some bacteria, fungi and protocists are pathogens.

(i) Name another type of pathogen.

(1)

(ii) Give an example of a disease caused by a protocist.

(1)

**(Total for Question = 6 marks)**

(b) Different groups of organism store carbohydrate as different molecules.

Complete the table to show an example from each group of organisms and the molecule they use to store carbohydrate.

(4)

Group	Example from the group	Molecule used to store carbohydrate
animals	cat	
plants	maize	
fungi		



**10** The passage describes how different organisms are classified into groups.

Complete the passage by writing a suitable word or words in each of the spaces.

(10)

Plants are multicellular organisms. They have chloroplasts to carry out photosynthesis and cell walls made of ..... They store carbohydrate as ..... or as sucrose.

Animals are also multicellular but do not carry out photosynthesis. They are able to move from place to place and are always described as ..... in food chains. They store carbohydrate as .....

Bacteria are single-celled organisms. They do not have a nucleus. Instead, they contain a circular ..... and smaller circles of DNA called ..... Most bacteria feed off other living or dead organisms but some bacteria can make their own food by .....

Examples of bacteria include *Lactobacillus*, used in the production of ..... from milk, and *Pneumococcus*, that acts as a ..... causing the disease .....



**1.2 Plants: these are multicellular organisms; their cells contain chloroplasts and are able to carry out photosynthesis; their cells have cellulose cell walls; they store carbohydrates as starch or sucrose. Examples include flowering plants, such as a cereal (for example, maize), and a herbaceous legume (for example, peas or beans).**

8 (a) Although plants and animals have many different features, they also have some features in common.

The table lists some features.

In each box, place a tick (✓) if the feature is present or a cross (✗) if the feature is absent. One has been done for you.

(4)

Feature	Plants	Animals
can move from place to place	✗	✓
can carry out photosynthesis		
are multicellular		
have cells with cell walls		
store carbohydrate as glycogen		

(b) Organisms that cause disease are known as pathogens.

Give **two** groups of organisms that include pathogens.

(2)

1 .....

2 .....



**1.2 Animals: these are multicellular organisms; their cells do not contain chloroplasts and are not able to carry out photosynthesis; they have no cell walls; they usually have nervous co-ordination and are able to move from one place to another; they often store carbohydrate as glycogen. Examples include mammals (for example, humans) and insects (for example, housefly and mosquito).**

(b) The table below shows some characteristics shared by most animals.

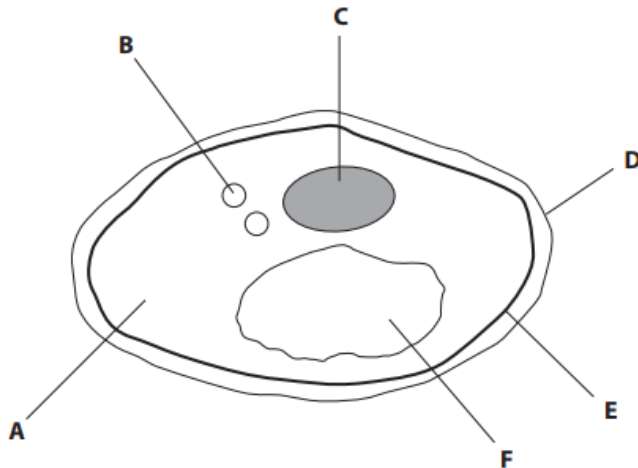
Complete the table by giving the missing characteristics and examples.

(4)

Characteristic	Example
they require nutrition	eating food
they respire	releasing energy from carbohydrate
	some animals can fly
they control their internal conditions	
	increase of the population of foxes
they grow	

**1.2 Fungi: these are organisms that are not able to carry out photosynthesis; their body is usually organised into a mycelium made from thread-like structures called hyphae, which contain many nuclei; some examples are single-celled; their cells have walls made of chitin; they feed by extracellular secretion of digestive enzymes onto food material and absorption of the organic products; this is known as saprotrophic nutrition; they may store carbohydrate as glycogen. Examples include *Mucor*, which has the typical fungal hyphal structure, and yeast, which is single-celled.**

Yeast is a single-celled fungus. The diagram shows a yeast cell with parts labelled A to F.



(a) The table lists functions of different parts of the yeast cell.

Complete the table by giving the letter of the part that carries out the function.

(2)

Function	Letter of part
controls the movement of molecules into the cell	
contains DNA that controls the cell	

(b) The table lists statements.

Put a tick (✓) in the boxes next to the statements that are correct for yeast.

(2)

Statement	Tick
can be used in the production of beer	
contains chloroplasts	
cell wall is made of chitin	
can only reproduce inside living cells	
contains plasmids	





11 The fungus *Fusarium venenatum* is grown in a fermenter to make a food product called mycoprotein.

(a) (i) Name the molecule that a fungus uses to store carbohydrate.

(1)

.....

(ii) Name the thread-like structures that make up the mycelium of a fungus.

(1)

.....

(a) Describe how fungi decompose tree logs.

(4)

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

**1.2 Protocists: these are microscopic single-celled organisms. Some, like *Amoeba*, that live in pond water, have features like an animal cell, while others, like *Chlorella*, have chloroplasts and are more like plants. A pathogenic example is *Plasmodium*, responsible for causing malaria.**

9 (a) The table shows features found in three groups of living organisms.

Complete the table using a tick (✓) to show that the group of living organisms shows the feature and a cross (✗) if the feature is absent.

(4)

Group	Feature			
	Cell wall	Plasmid	Cytoplasm	Nucleus
bacteria			✓	
fungi				✓
protocists	✗	✗		



(b) Some bacteria, fungi and protoctists are pathogens.

(i) Name another type of pathogen.

(1)

(ii) Give an example of a disease caused by a protoctist.

(1)

**1.3 describe the common features shown by prokaryotic organisms such as bacteria**

**Bacteria: these are microscopic single-celled organisms; they have a cell wall, cell membrane, cytoplasm and plasmids; they lack a nucleus but contain a circular chromosome of DNA; some bacteria can carry out photosynthesis but most feed off other living or dead organisms. Examples include *Lactobacillus bulgaricus*, a rod-shaped bacterium used in the production of yoghurt from milk, and *Pneumococcus*, a spherical bacterium that acts as the pathogen causing pneumonia.**

The table gives features of three different groups of organism.

Complete the table by putting a tick (✓) in the box if the organisms in the group have the feature and a cross (✗) in the box if the organisms in the group do not have the feature. The first one has been done for you.

(4)

Feature of organism	Group of organism		
	Bacteria	Fungus	Virus
have a protein coat	✗	✗	✓
all are pathogens			
cell walls made of chitin			
contain DNA in a nucleus			
respire			



1 Listeriosis is an illness caused by eating food containing the bacterium *Listeria*.

(a) The diagram shows the cell wall of one of these bacteria. Other structures found in the bacterium are not shown.

Draw and label three other structures that would be found in the bacterium.

(3)



1 (a) The diagram shows the cell wall of a bacterium.

Complete the diagram by drawing and labelling the parts found inside the cell wall.

(3)



(b) Decomposition by bacteria helps to release mineral ions, such as nitrates, into the soil.

**1.4 understand the term pathogen and know that pathogens may include fungi, bacteria, protists or viruses**

**Viruses: these are not living organisms. They are small particles, smaller than bacteria; they are parasitic and can reproduce only inside living cells; they infect every type of living organism. They have a wide variety of shapes and sizes; they have no cellular structure but have a protein coat and contain one type of nucleic acid, either DNA or RNA. Examples include the tobacco mosaic virus that causes discolouring of the leaves of tobacco plants by preventing the formation of chloroplasts, the influenza virus that causes 'flu' and the HIV virus that causes AIDS.**



**1** Bacteria, fungi and protoctists can cause disease and have features common to all living organisms.

Viruses can cause disease but are not classified as living.

(a) (i) Explain why viruses are not classified as living.

(2)

.....

.....

.....

.....

.....

(ii) Name a disease caused by a virus.

(1)

.....

(b) A new group of pathogens called prions was discovered in the 1980s.

Prions are simple proteins.

All known prion diseases can be fatal because the immune system does not recognise prions as foreign.

Suggest two ways in which prions differ from viruses.

(2)

1 .....

.....

2 .....

.....



3 The following organisms can be classified into major groups.

<i>Amoeba</i>	<i>Lactobacillus</i>	bean	<i>Mucor</i>	mosquito
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(a) From the list above give the name of (4)

- (i) a bacterium .....
- (ii) a fungus .....
- (iii) a flowering plant .....
- (iv) an animal .....

(b) Viruses are not included in most classification systems.

(i) Give **three** ways in which viruses differ from other living organisms. (3)

- 1 .....
- 2 .....
- 3 .....

(ii) Give **one** example of a disease caused by a virus, name the organism it infects and describe its effect on the organism. (3)

Disease .....

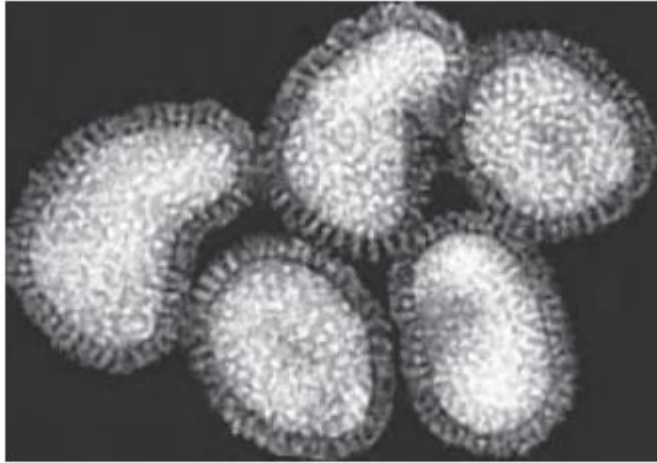
Organism infected .....

Effect .....

.....

.....

4 The photograph shows some viruses.



(a) Suggest two reasons why most biologists do not classify viruses as living organisms.

(2)

1 .....

2 .....

(b) Name one example of a virus.

(1)

(c) Give one structural difference between a bacterium and a virus.

(1)



**3** The passage describes how viruses can affect humans.

Complete the passage by writing a suitable word or words in each of the spaces.

(7)

Humans are affected by many viruses. Viruses only contain one sort of

..... acid, either DNA or .....

One virus, which causes the disease AIDS, is the ..... virus. People with

AIDS are vulnerable to infection because their ..... system does not

work so effectively. This means they are unable to produce ..... blood

cells that normally fight off infections by producing specific proteins

called ..... that help to destroy pathogens.

Diseases caused by viruses can be prevented by injecting the body with an inactive

form of the virus. The method of injecting is known as ..... and

stimulates the body's defence system to produce memory cells.