

Name: _____

IGCSE Biology -Paper 1 : Topic 1: The nature and variety of living organisms

Sub Topic :1.1 Understand the basic characteristics shared by all living organisms

Date:

Time:

Total marks available:

Total marks achieved: _____

Questions

Q1.

All living organisms have certain characteristics.

(a) Describe what is meant by the following characteristics:

(i) respiration

(2)

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.....

(ii) control of their internal conditions

(2)

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

(b) Organisms are organised into different levels.

What is the correct order of the levels?

(1)

- A** organ, system, tissue, cell, organelle
- B** organ, tissue, cell, system, organelle
- C** organelle, cell, tissue, organ, system
- D** system, cell, organelle, organ, tissue

(c) Yeast is an example of which group of organism?

(1)

- A** animals
- B** bacteria
- C** fungi
- D** protocists

(Total for question = 6 marks)

(Q01 4SS0/1B, SAM 0)

Q2.

All living organisms have certain characteristics.

(a) Describe what is meant by the following characteristics:

(i) respiration

(2)

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.....

.....

(ii) control of their internal conditions

(2)

.....

.....

.....

.....

(b) Organisms are organised into different levels.

What is the correct order of the levels?

(1)

- A** organ, system, tissue, cell, organelle
- B** organ, tissue, cell, system, organelle
- C** organelle, cell, tissue, organ, system
- D** system, cell, organelle, organ, tissue

(c) Yeast is an example of which group of organism?

(1)

- A** animals
- B** bacteria
- C** fungi
- D** protocists

(Total for question = 6 marks)

(Q01 4SS0/1B, SAM 0)

Q3.

Answer the questions with a cross in the boxes you think are correct . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

Living organisms share a number of characteristics.

(a) State two of the characteristics shared by living organisms.

(2)

1

2

(b) Organisms are classified into different groups based on their features.

(i) Which feature is found in fungi?

(1)

- A** chloroplast
- B** cellulose cell wall
- C** hypha
- D** plasmid

(ii) Which organism is classified as a fungus?

(1)

- A** amoeba
- B** chlorella
- C** mucor
- D** plasmodium

(c) Viruses are not classified as living organisms.

Explain one reason why viruses are not classified as living organisms.

(2)

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(Total for question = 6 marks)

(Q01 4SS0/1B, June 2023)

Q4.

(a) All living organisms share characteristics.

(i) State two characteristics that all living organisms share.

(2)

1

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2

(ii) Some organisms are pathogens.

Which of these organisms can cause a bacterial disease in humans?

(1)

- A *Chlorella*
- B *Lactobacillus bulgaricus*
- C *Mucor*
- D *Pneumococcus*

(b) Viruses are pathogens but not living organisms.

(i) Describe the effect of a named virus that infects plants.

(2)

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(ii) Give three differences between the structure of viruses and bacteria.

(3)

1

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2

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3

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(Total for question = 8 marks)

(Q01 4BI1/1B, June 2023)

Yeast cells can be genetically modified to produce the proteins found on the outside of viruses.

(a) (i) Yeast is a single-celled organism.

A yeast cell has a nucleus, and the cell wall is made of chitin.

Which group of organisms does yeast belong to?

(1)

- A** animals
- B** fungi
- C** plants
- D** protocists

(ii) Give a reason why viruses are not considered to be living organisms.

(1)

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(b) A species of yeast is genetically modified to produce a protein found on the outside of a hepatitis B virus.

This protein is used to make vaccines to prevent people being infected with hepatitis B.

The gene for this protein is inserted into a plasmid.

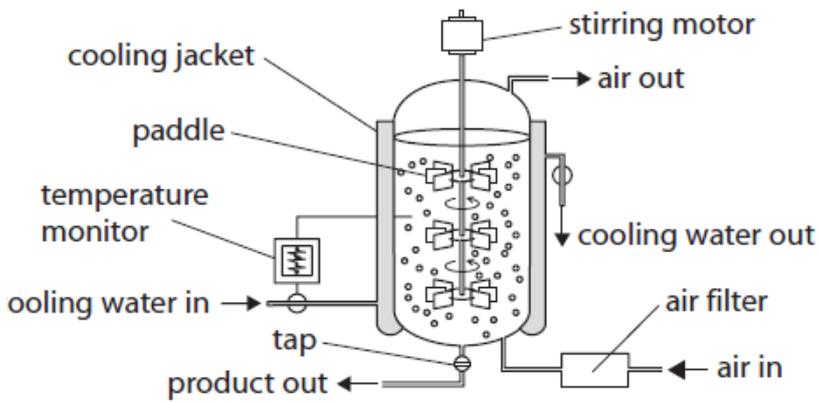
This plasmid is then used to modify the yeast cells.

Give the roles of two named enzymes used to produce plasmids containing the gene for the hepatitis B protein.

(2)

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(c) The diagram shows an industrial fermenter that can be used to grow large quantities of genetically modified yeast.



(i) Explain the function of the temperature monitor and cooling jacket.

(3)

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(ii) Explain why air is needed in the fermenter.

(2)

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(iii) Explain why the air is filtered before going into the fermenter.

(2)

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(Total for question = 11 marks)

Mark Scheme

Q1.

Question number	Answer	Additional guidance	Mark
(a)(i)	A description that makes reference to the following two points: <ul style="list-style-type: none"> • release of energy (1) • within cells (1) 	reject production of energy	2

Question number	Answer	Additional guidance	Mark
(a)(ii)	A description that makes reference to the following points: <ul style="list-style-type: none"> • keeping named characteristic, e.g. temperature (1) • constant within narrow range (1) 	allow blood glucose/carbon dioxide/blood pressure/water content/equivalent	2

Question number	Answer	Mark
(b)	C	1

Question number	Answer	Mark
(c)	C	1

Q2.

Question number	Answer	Additional guidance	Mark
(a)(i)	A description that makes reference to the following two points: <ul style="list-style-type: none"> • release of energy (1) • within cells (1) 	reject production of energy	2

Question number	Answer	Additional guidance	Mark
(a)(ii)	A description that makes reference to the following points: <ul style="list-style-type: none"> • keeping named characteristic, e.g. temperature (1) • constant within narrow range (1) 	allow blood glucose/carbon dioxide/blood pressure/water content/equivalent	2

Question number	Answer	Mark
(b)	C	1

Question number	Answer	Mark
(c)	C	1

(Q01 4SS0/1B, SAM 0)

Q3.

Question Number	Answer	Mark
(a)	An answer that makes reference to two of the following points: <ul style="list-style-type: none"> • nutrition / feeding / eq (1) • respire / eq (1) • excrete / eq (1) • respond to their surroundings / eq (1) • move /eq (1) • control their internal conditions / homeostasis /eq (1) • reproduce / eq (1) • grow / develop / eq (1) 	2

Question Number	Answer	Mark
(b)(i)	<p>The only correct answer is C hypha</p> <p>A is not correct as they do not contain chloroplasts</p> <p>B is not correct as they do not contain cellulose cell wall</p> <p>D is not correct as they do not contain plasmids</p>	1

Question Number	Answer	Mark
(b)(ii)	<p>The only correct answer is C <i>Mucor</i></p> <p>A is not correct as <i>Amoeba</i> is not a fungus</p> <p>B is not correct as <i>Chlorella</i> is not a fungus</p> <p>D is not correct as <i>Plasmodium</i> is not a fungus</p>	1

Question Number	Answer	additional guidance	Mark
(c)	<p>An explanation that makes reference to two of the following points:</p> <ul style="list-style-type: none"> cannot reproduce / eq (1) without host cell / eq (1) <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> do not have cellular structure /cells / eq (1) living organisms have cells / eq (1) <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> they do not respire / do not grow / do not excrete / do not respond to stimuli (1) do not show characteristics / features of living organisms /eq (1) 	<p>only reproduce within host /eq</p> <p>ignore don't have nucleus</p> <p>do not respire or grow =1</p> <p>do not show features of living organisms =1</p> <p>do not respire have features of living organisms =2</p>	2
Total = 6 marks			

Q4.

Question Number	Answer	Mark
(a)(i)	<p>An answer that makes reference to two of the following:</p> <ul style="list-style-type: none"> • (require) nutrition / food / eq (1) • respire /eq (1) • excrete (waste) /eq (1) • respond to surroundings / sensitivity / eq (1) • move /eq (1) • control their internal conditions / homeostasis /eq (1) • reproduce /eq (1) • grow / develop /eq (1) 	2

Question Number	Answer	Mark
(a)(ii)	<p>The only correct answer is</p> <p>D <i>Pneumococcus</i></p> <p>A is not the answer as <i>Chlorella</i> does not cause bacterial disease in humans</p> <p>B is not the answer as <i>Lactobacillus bulgaricus</i> does not cause bacterial disease in humans</p> <p>C is not the answer as <i>Mucor</i> does not cause bacterial disease in humans</p>	1

Question Number	Answer	Additional guidance	Mark
(b) (i)	<ul style="list-style-type: none"> • Tobacco mosaic virus/ TMV (1) • discoloured leaves / yellow leaves / yellow spots / white leaves / white spots / no chlorophyll/ no chloroplasts / less chlorophyll / no photosynthesis / less photosynthesis /eq (1) 	<p>Allow other correctly named plant virus and effect</p> <p>not just less growth</p> <p>effect without correct virus scores zero</p>	2

Question Number	Answer	Additional guidance	Mark
(b) (ii)	<p>An answer that makes reference to three of the following: Virus</p> <ul style="list-style-type: none"> • smaller / eq (1) • protein coat (1) • no cell wall (1) • no cell membrane / eq (1) • no cytoplasm / organelles / ribosomes / no vacuole / eq (1) • no plasmids (1) • no flagella (1) 	<p>Mark first 3 answers allow converse</p> <p>ignore nucleus mitochondria Golgi</p> <p>ignore chloroplasts loop or circles of DNA</p>	3

Total 8 marks

(Q01 4BI1/1B, June 2023)

Q5.

Question Number	Answer	Additional guidance	Mark
(a)(i)	<p>B (fungi) is the only correct answer</p> <p>A is incorrect as animals are not single celled</p> <p>C is incorrect as plants do not have chitin or are single celled</p> <p>D is incorrect as protocists do not have chitin</p>		1

Question Number	Answer	Additional guidance	Mark
(a)(ii)	<p>An answer that makes reference to one of the following:</p> <ul style="list-style-type: none"> (viruses) do not grow (1) (viruses) do not respire (1) (viruses) are not sensitive / have internal control / eq (1) (viruses) do not move (1) (viruses) do not excrete (1) (viruses) do not reproduce (independently) / need a host to reproduce / eq (1) (viruses) do not feed / have a nutritional need / eq (1) 	<p>Allow do not carry out life processes / do not have all the characteristics of life /do not have MRSGREN(C)</p> <p>Ignore need another living organisms / host to live / survive</p> <p>Ignore need to live inside another cell</p>	1

Question Number	Answer	Additional guidance	Mark
(b)	<p>An answer that makes reference to the following:</p> <ul style="list-style-type: none"> restriction (enzymes) cut DNA /gene / plasmid / open plasmid / remove gene / eq (1) ligase joins DNA to plasmid / joins DNA / joins sticky ends / inserts DNA / attaches DNA / eq (1) 	<p>Allow endonuclease</p> <p>Reject lipase</p>	2

Question Number	Answer	Additional guidance	Mark
(c)(i)	<p>An explanation that makes reference to three of the following:</p> <ul style="list-style-type: none"> respiration / fermentation / (chemical) reactions, releases heat (energy) (1) checks / monitor, temperature and lets (cooling) water in / open valve / water is pumped around / eq (1) lowers temperature / removes heat / prevents over heating / stops temperature getting too high (1) maintain <u>optimal temperature</u> / <u>optimum temperature</u> (1) stop <u>enzymes</u> denaturing / stops <u>enzyme</u> shape changing / eq (1) 	<p>Ignore cools it down alone</p>	3

Question Number	Answer	Additional guidance	Mark
(c)(ii)	<p>An explanation that makes reference to two of the following:</p> <ul style="list-style-type: none"> • (provides) oxygen (1) • for respiration / prevent anaerobic respiration (1) 	<p>Reject for anaerobic respiration</p>	2

Question Number	Answer	Additional guidance	Mark
(c)(iii)	<p>An explanation that makes reference to two of the following:</p> <ul style="list-style-type: none"> • prevent other microbes / bacteria / fungi / pathogens / eq (1) • prevents <u>contamination</u> / <u>contaminate</u> (of product) / toxins (being released) / competition (for nutrients) / eq (1) 	<p>Allow remove bacteria / keep sterile Ignore germs / keep clean</p>	2

(Q02 4BI1/1BR, June 2022)