

Cell Structure

Question Paper 1

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Cell Structure
Sub Topic	
Booklet	Multiple Choice
Paper Type	Question Paper 1

Time Allowed : 60 minutes

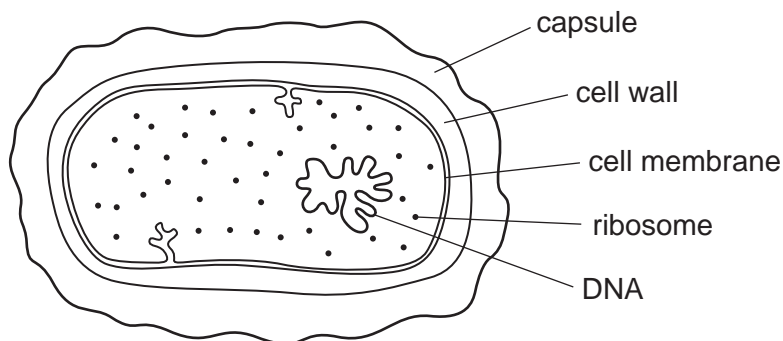
Score : / 50

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

- 1 The diagram shows a high-power drawing of a bacterium.

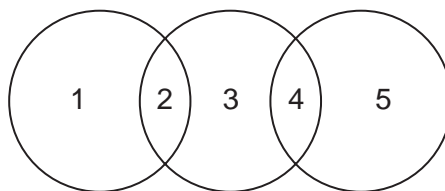


Which three components are found in **both** this bacterium and an animal cell?

- A** capsule, cell membrane and cell wall
B capsule, DNA and ribosome
C cell membrane, cell wall and DNA
D cell membrane, DNA and ribosome
- 2 Which structures are found in typical eukaryotic cells?
- 1 70S ribosomes
 - 2 80S ribosomes
 - 3 linear DNA (chromosomes)
 - 4 circular DNA
- A** 1, 2
B 1, 2 and 3
C 1 and 4 only
D 2 and 3 only

- 7 What are found in both mitochondria and typical prokaryotic cells?
- A** 70S ribosomes and circular DNA
 - B** 70S ribosomes only
 - C** 80S ribosomes and circular DNA
 - D** circular DNA only
- 8 Which comparison of a phloem companion cell with a B-lymphocyte is correct?
- A** Both cell types have proteins embedded in their cell surface membranes.
 - B** B-lymphocytes have a spherical nucleus but companion cells do not have a nucleus.
 - C** Companion cells always contain chloroplasts, which are not present in B-lymphocytes.
 - D** Neither B-lymphocytes nor companion cells possess plasmodesmata.
- 9 Where would cisternae be found in a cell?
- 1 endoplasmic reticulum
 - 2 Golgi apparatus
 - 3 mitochondrion
- A** 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 1 only

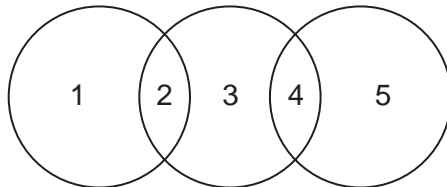
- 10 The diagram shows some similarities between chloroplasts, mitochondria and typical prokaryotes.



Which row is correct?

	1	2	3	4	5
A	chloroplasts	circular DNA	mitochondria	80S ribosomes	prokaryotes
B	chloroplasts	80S ribosomes	mitochondria	circular DNA	prokaryotes
C	prokaryotes	circular DNA	mitochondria	circular DNA	chloroplasts
D	prokaryotes	70S ribosomes	chloroplasts	ribosomes	mitochondria

- 11 The diagram shows some similarities between chloroplasts, mitochondria and typical prokaryotes.



Which row is correct?

	1	2	3	4	5
A	chloroplasts	70S ribosomes	prokaryotes	70S ribosomes	mitochondria
B	chloroplasts	70S ribosomes	prokaryotes	80S ribosomes	mitochondria
C	mitochondria	70S ribosomes	chloroplasts	80S ribosomes	prokaryotes
D	mitochondria	80S ribosomes	chloroplasts	80S ribosomes	prokaryotes

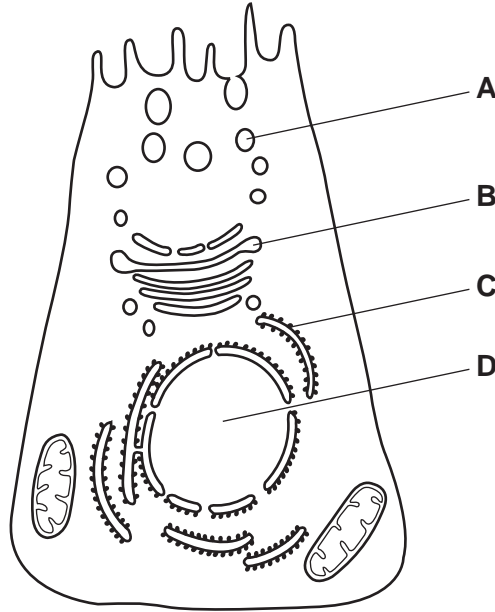
- 12 In order to complete the sentence below, what is the correct process and cell structure?

Cells which have a high rate of1..... will have many2..... .

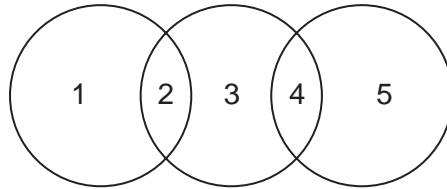
	1	2
A	DNA replication	lysosomes
B	exocytosis	vesicles
C	facilitated diffusion	mitochondria
D	phospholipid production	ribosomes

- 13 A cell secreting glycoproteins is supplied with radioactively-labelled glucose which is detected in the cytoplasm first.

In which organelle would radioactively-labelled glucose be detected next?



- 14 The diagram shows some similarities between chloroplasts, mitochondria and prokaryotes.



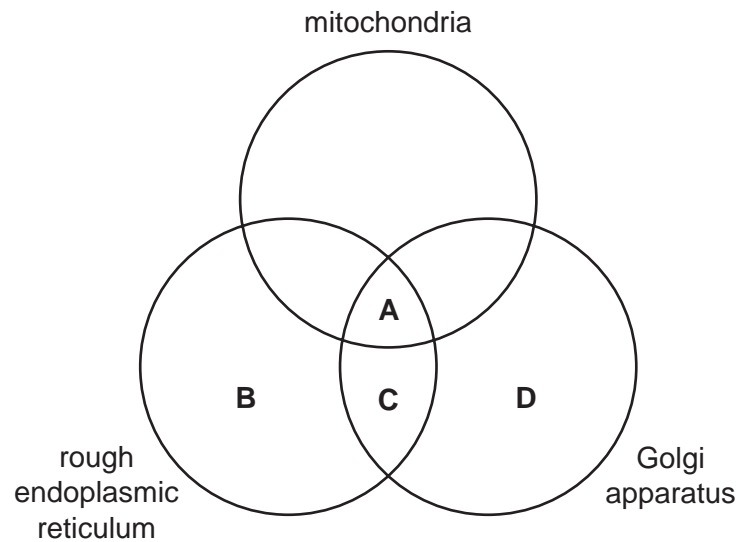
Which row is correct?

	1	2	3	4	5
A	chloroplasts	circular DNA	mitochondria	linear DNA	prokaryotes
B	mitochondria	linear DNA	chloroplasts	70S ribosomes	prokaryotes
C	mitochondria	70S ribosomes	chloroplasts	linear DNA	prokaryotes
D	prokaryotes	70S ribosomes	mitochondria	70S ribosomes	chloroplasts

15 What is the function of nucleoli?

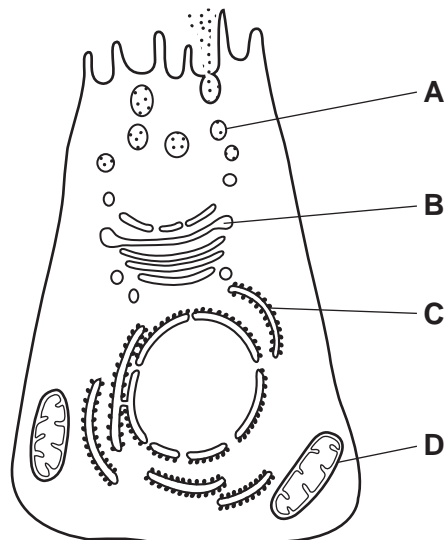
- A formation and breakdown of the nuclear envelope
- B formation of centromeres
- C formation of ribosomes
- D formation of the spindle during nuclear division

16 Which organelles are required for the formation of the hydrolytic enzymes found in lysosomes?



17 The diagram is taken from an electronmicrograph of a cell which secretes enzymes.

Where are these enzymes made?

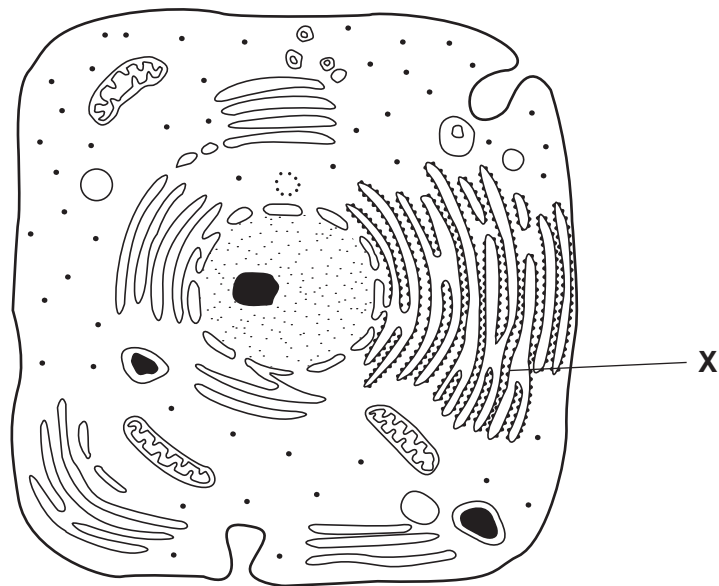


18 Which features enable an organism to be identified as a prokaryote?

- 1 cell wall
- 2 circular DNA
- 3 nucleus
- 4 ribosomes

A 2 only **B** 3 only **C** 1 and 4 only **D** 2 and 4 only

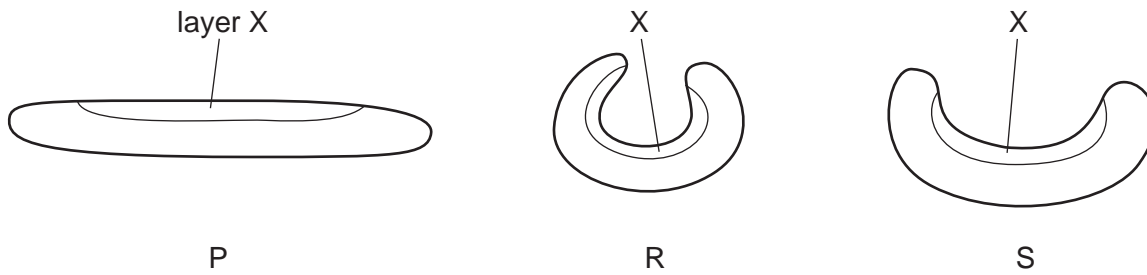
19 The diagram shows an electronmicrograph of a typical animal cell.



What is the function of the membrane system labelled **X**?

- A** lipid synthesis
- B** lipid synthesis and transport
- C** protein synthesis
- D** protein synthesis and transport

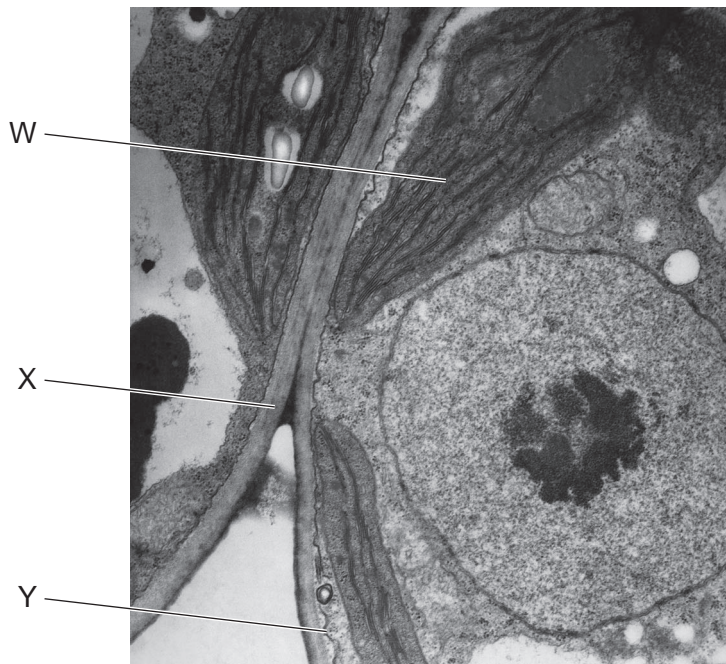
- 20 The diagram shows three xerophytic leaves of the same type in three different conditions, P, R and S.



Which description of the water potential of the cells in layer X is correct?

	water potential of cells in layer X		
	P	R	S
A	less negative than R and S	more negative than P and S	more negative than P
B	less negative than S	more negative than P	less negative than P
C	more negative than R	less negative than S	less negative than R
D	more negative than R and S	less negative than P	more negative than P

21 The electronmicrograph shows part of two cells.



Which of the labelled features enable these cells to be identified as eukaryotic?

- A** W only **B** X only **C** W and X only **D** W, X and Y

22 When mucus is secreted from a goblet cell in the trachea, these events take place.

- 1 addition of carbohydrate to protein
- 2 fusion of the vesicle with the plasma membrane
- 3 secretion of a glycoprotein
- 4 separation of a vesicle from the Golgi apparatus

What is the sequence in which these events take place?

- A** 1 → 4 → 2 → 3
B 1 → 4 → 3 → 2
C 4 → 1 → 2 → 3
D 4 → 1 → 3 → 2

23 What is a function of the smooth endoplasmic reticulum?

- A antibody synthesis
- B enzyme synthesis
- C protein synthesis
- D steroid synthesis

24 What are **always** present in prokaryote cells?

- A capsules
- B flagella
- C pili
- D ribosomes

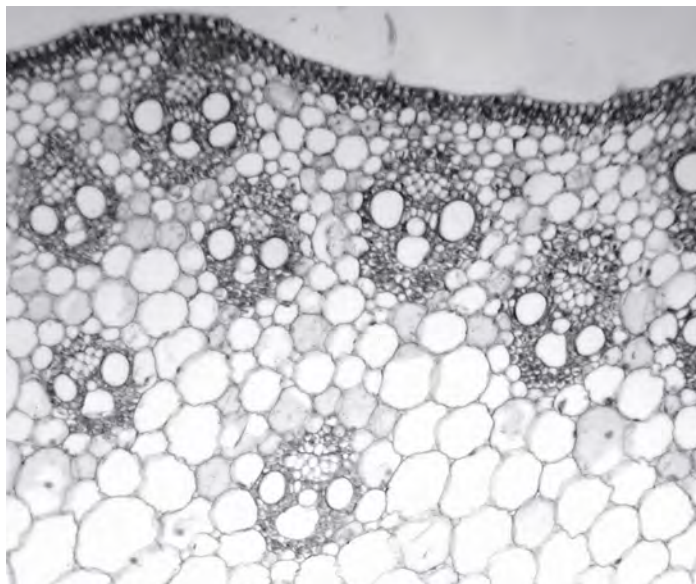
25 The following are all features of eukaryotic cells.

- 1 chloroplast
- 2 endoplasmic reticulum
- 3 lysosome
- 4 mitochondrion
- 5 nucleus

Which of these have a double membrane?

- A 1, 2 and 3
- B 1, 3 and 4
- C 1, 4 and 5
- D 2, 3 and 4

- 26 A student was asked to draw a plan diagram of the plant tissue shown in the photomicrograph and to annotate two observable features.



What are the correct annotations?

- A epidermis darkly stained layer of cells, xylem hollow vessels
 - B epidermis formed of single layer of cells, xylem strengthened by lignin
 - C phloem small cells, xylem empty cells to transport water
 - D vascular bundles arranged in a regular pattern, xylem large dead cells
- 27 Which structure is present in **all** eukaryotic cells but **not** present in prokaryotic cells?
- A 70S ribosome
 - B cell wall
 - C chromatin
 - D plasmid

28 Which structures are present in a typical plant cell?

	centrioles	cilia	mitochondria	vacuole
A	✓	✓	x	x
B	✓	x	x	✓
C	x	✓	✓	x
D	x	x	✓	✓

key

✓ = present

x = absent

29 Membranous sacs containing products of metabolism are formed by the endoplasmic reticulum in cells.

Where are these products used?

- A** inside and outside the cell
- B** inside lysosomes only
- C** inside the cell only
- D** outside the cell only

30 Which of the structures are found in photosynthetic prokaryotes?

- 1 cell surface membrane
- 2 cellulose wall
- 3 mesosomes
- 4 ribosomes
- 5 chloroplasts

- A** 1, 2, 3 and 4 only
- B** 1, 2, 4 and 5 only
- C** 1, 3 and 4 only
- D** 2, 3 and 5 only

31 Which structures are found in both animal and plant cells?

- 1 centriole
- 2 lysosome
- 3 nucleolus
- 4 vacuole

- A** 1 and 3 only
- B** 2 and 4 only
- C** 2, 3 and 4
- D** 1, 2 and 3

32 Which observations suggest that a cell is eukaryotic?

	cytoplasm includes endoplasmic reticulum	protein molecules are associated with the DNA	ribosomes distributed through the cytoplasm
A	✓	x	✓
B	x	✓	x
C	x	x	x
D	✓	✓	✓

key

✓ = found in eukaryotes

x = not found in eukaryotes

33 A plan diagram is made of a transverse section of a leaf.

Which features should be seen in the diagram?

- 1 the overall distribution of tissues
- 2 the relative thicknesses of the tissue layers
- 3 those cells which contain chloroplasts

- A** 1 and 2 only
- B** 1 and 3 only
- C** 2 and 3 only
- D** 1, 2 and 3

34 The table shows some of the structural features present or absent in four different cell types.

Which identifies the cell type for each column of features?


key

✓ = feature present

x = feature absent

cell wall	✓	✓	x	✓
centrioles	x	x	✓	x
chloroplast	✓	x	x	x
Golgi apparatus	✓	✓	✓	x
large vacuole	✓	✓	x	x
A	ciliated epithelial cell	prokaryotic cell	root cortex cell	spongy mesophyll cell
B	root cortex cell	spongy mesophyll cell	prokaryotic cell	ciliated epithelial cell
C	prokaryotic cell	ciliated epithelial cell	spongy mesophyll cell	root cortex cell
D	spongy mesophyll cell	root cortex cell	ciliated epithelial cell	prokaryotic cell

35 What is the order of size of cell components?

	largest  smallest			
A	centrioles	mitochondria	lysosomes	nucleoli
B	mitochondria	nucleoli	lysosomes	centrioles
C	nucleoli	mitochondria	centrioles	lysosomes
D	nucleoli	centrioles	mitochondria	lysosomes

36 Which structure is present in cells of eukaryotes but not present in cells of prokaryotes?

- A** 70s ribosome
- B** chromatin
- C** mesosome
- D** plasmid

37 Membranous sacs containing products of metabolism are formed by the endoplasmic reticulum in cells.

Where are these products used?

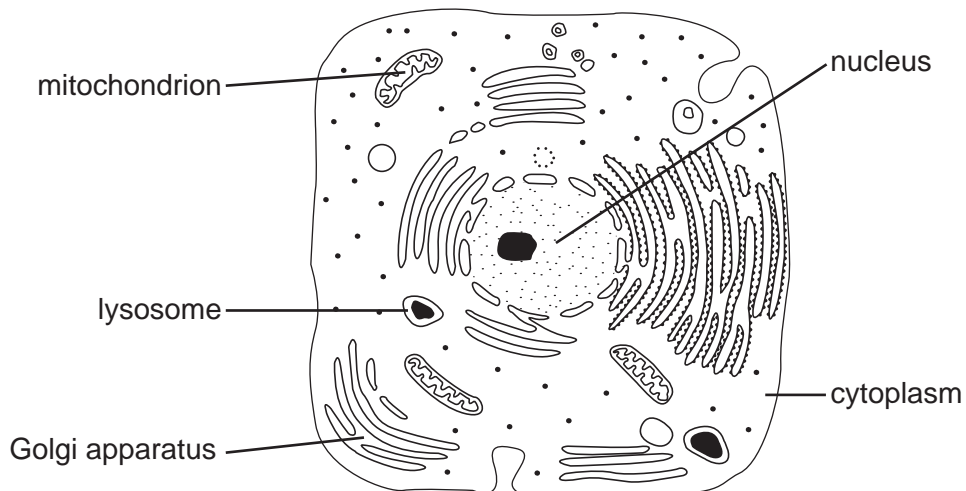
- A** inside and outside the cell
- B** inside lysosomes only
- C** inside the cell only
- D** outside the cell only

38 In 1985, a giant bacterium, *Epulopiscium fishelsoni*, was discovered.

Which cell structure(s) would be present in *Epulopiscium* enabling biologists to classify this organism as prokaryotic?

- A** a cellulose cell wall outside the plasma membrane
- B** a pair of centrioles close to the nuclear area
- C** circular DNA lying free in the cytoplasm
- D** smooth endoplasmic reticulum throughout the cytoplasm

39 The diagram shows a drawing of an electron micrograph of a cell.



Which structures are surrounded by double membranes?

	Golgi apparatus	lysosome	mitochondrion	nucleus	cytoplasm
A	✓	✓	✓	✓	✓
B	✓	x	x	x	x
C	x	x	✓	✓	x
D	x	✓	x	x	✓

40 In which animal cells would Golgi apparatus be most abundant?

- A** ciliated epithelial cells
- B** goblet cells
- C** red blood cells
- D** smooth muscle cells

- 41 Which is a feature of all prokaryotic cells?
- A** absence of cell surface membrane
 - B** division by mitosis
 - C** presence of mitochondria
 - D** presence of ribosomes
- 42 What identifies a cell as a prokaryote?
- A** The DNA is associated with protein.
 - B** The DNA is in a circular form.
 - C** The DNA is in the form of a double spiral.
 - D** The DNA is surrounded by a membrane system.
- 43 What is a function of the smooth endoplasmic reticulum?
- A** aerobic respiration
 - B** intracellular digestion
 - C** synthesis of steroids
 - D** transport of proteins
- 44 When mitochondria are extracted from cells for biochemical study, they are usually kept in a 0.25 mol dm^{-3} sucrose solution.
- Why is the sucrose solution used?
- A** to act as a solvent
 - B** to enable the rate of respiration of the mitochondria to be determined
 - C** to prevent the mitochondria from changing in structure
 - D** to provide a source of energy

45 For which process is the large surface area of the cristae in the mitochondria important?

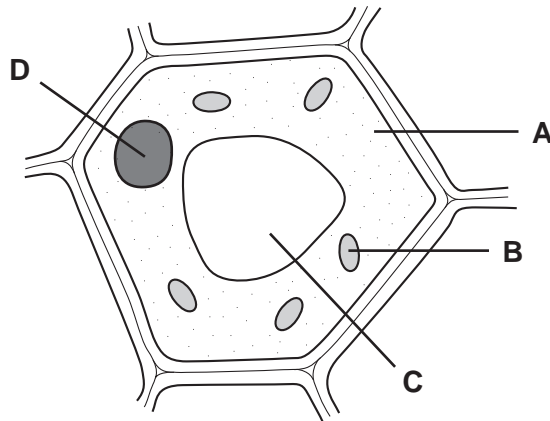
- A energy radiation
- B enzyme reaction
- C gaseous exchange
- D protein synthesis

46 What is the order of size of cell components?

	largest → smallest			
A	mitochondria	ribosomes	starch grains	nuclei
B	nuclei	chloroplasts	mitochondria	ribosomes
C	ribosomes	mitochondria	chloroplasts	starch grains
D	starch grains	mitochondria	chloroplasts	ribosomes

47 The diagram shows the structure of a typical plant cell.

Which cell component is also present in prokaryotes?



- 48 What is the function of nucleoli?
- A the formation and breakdown of the nuclear envelope
 - B the formation of centromeres
 - C the formation of ribosomes
 - D the organisation of the spindle during nuclear division
- 49 An actively growing cell is supplied with radioactive amino acids.
- Which cell component would first show an increase in radioactivity?
- A Golgi body
 - B mitochondrion
 - C nucleus
 - D rough endoplasmic reticulum
- 50 Which pair of organelles has internal membranes?
- A chloroplasts and mitochondria
 - B chloroplasts and nuclei
 - C mitochondria and ribosomes
 - D nuclei and ribosomes