



CHEMISTRY ONLINE
— **TUITION** —

Phone: +442081445350

www.chemistryonlinetuition.com

Email: asherrana@chemistryonlinetuition.com

BIOLOGY

FOUNDATIONS IN BIOLOGY

Level & Board	OCR (A-LEVEL)
TOPIC:	CELL STRUCTURE
PAPER TYPE:	QUESTION PAPER - 4
TOTAL QUESTIONS	10
TOTAL MARKS	/37

ChemistryOnlineTuition Ltd reserves the right to take legal action against any individual/ company/organization involved in copyright abuse.

Cell Structure QP - 4

1.

A transmission electron micrograph of a portion of a eukaryotic cell is displayed in Figure 20.1.

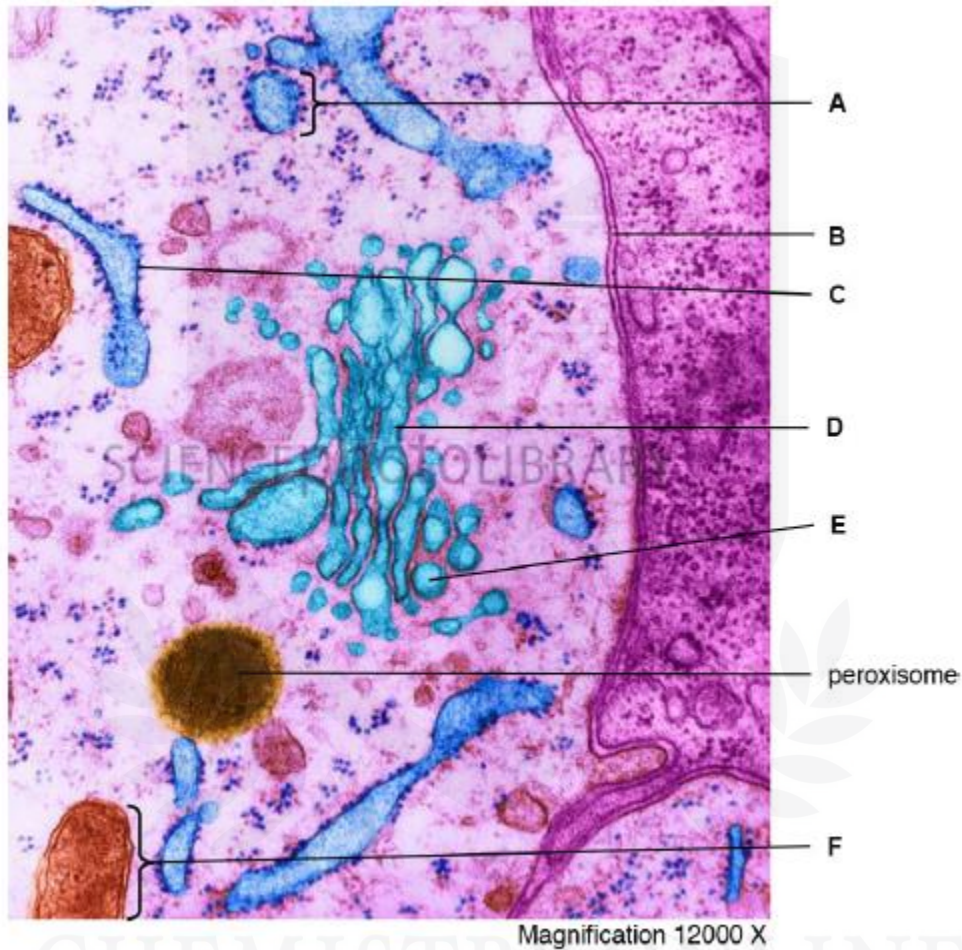
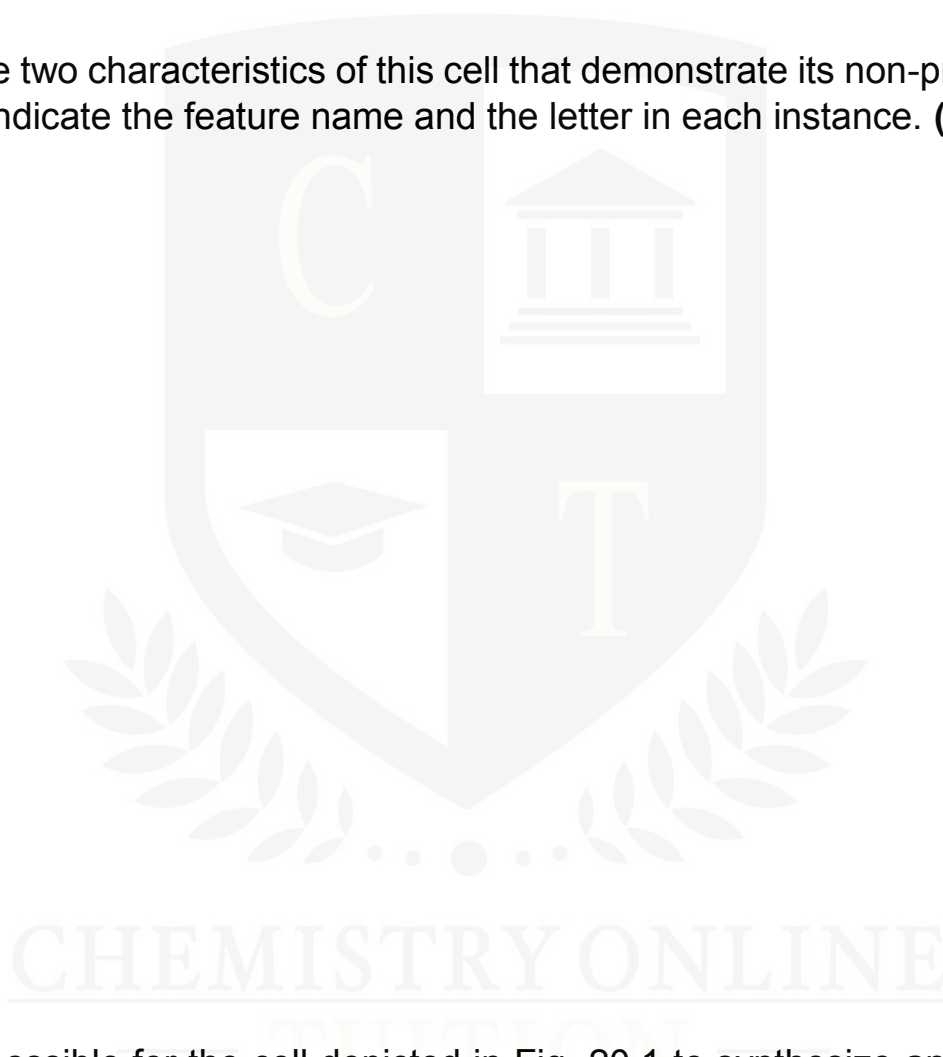


Fig. 20.1

(a) Name one internal characteristic of the cell that is also present in a prokaryotic cell. (2)

I am Sorry !!!!!

(b) Name two characteristics of this cell that demonstrate its non-prokaryotic nature. Indicate the feature name and the letter in each instance. **(2)**



(c) It is possible for the cell depicted in Fig. 20.1 to synthesize and secrete proteins. List the correct order of the organelles involved in protein synthesis and secretion using only the letters found in Figure 20.1. **(3)**

I am Sorry !!!!!

2.

(a) Which of the following best sums up the route that proteins that are exported from a cell—like digestive enzymes—take? (1)

A: Golgi apparatus → rough endoplasmic reticulum → secretory vesicle

B: Ribosome → smooth endoplasmic reticulum → Golgi apparatus

C: Rough endoplasmic reticulum → Golgi apparatus → secretory vesicle

D: Smooth endoplasmic reticulum → ribosome → Golgi apparatus

3.

(a) In eukaryotes, which of the following organelles—A through D—is not engaged in the synthesis and secretion of enzymes? (1)

A: Golgi apparatus

B: Ribosomes

C: Smooth endoplasmic reticulum

D: Vesicle

4.

(a) The α -amylase enzyme helps humans absorb polysaccharides from food into their bloodstream.

On chromosome 1, the human α -amylase gene is located.

In salivary gland cells, the gene is transcribed in the nucleus and translated on the rough endoplasmic reticulum.

Explain the process by which salivary gland cells prepare and secrete the chemical following translation. **(3)**

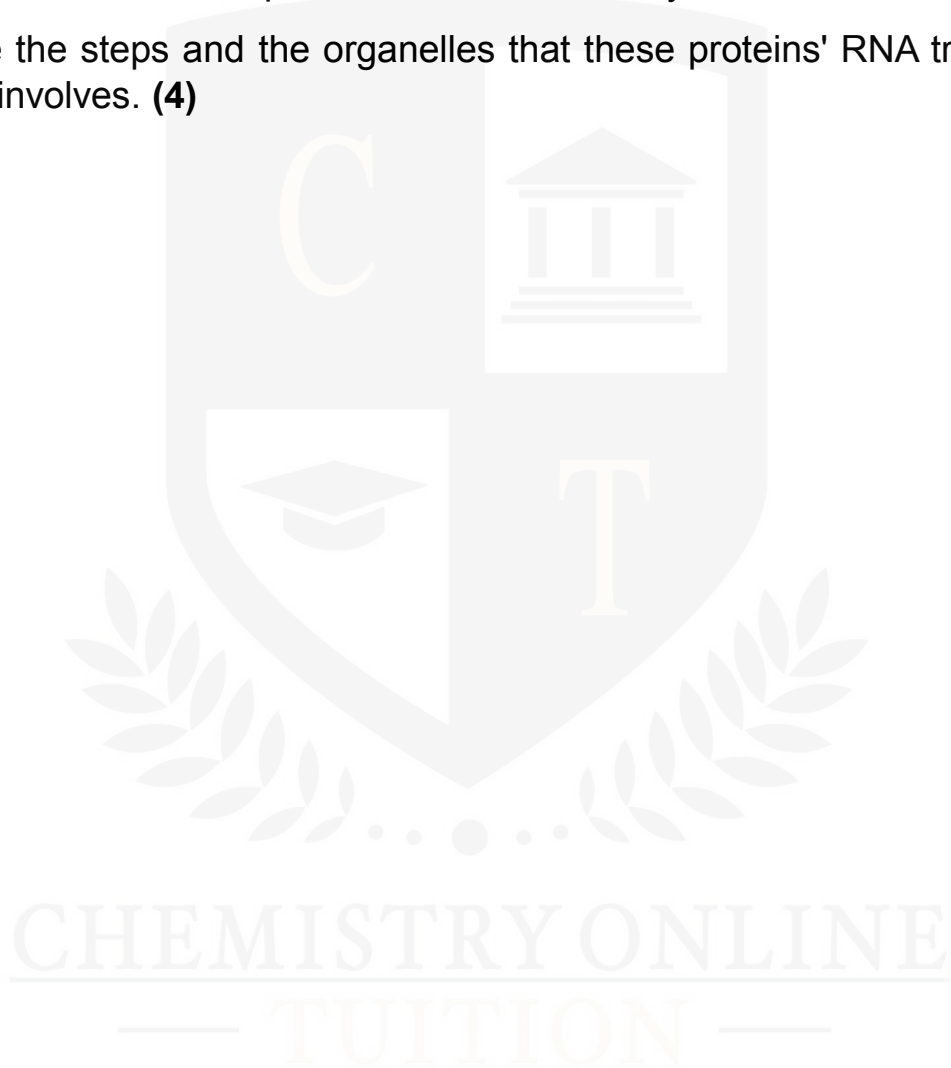
CHEMISTRY ONLINE
— TUITION —

I am Sorry !!!!!

5.

(a) Proteins found in the plasma membrane are synthesized within the cell.

Describe the steps and the organelles that these proteins' RNA translation process involves. **(4)**



I am Sorry !!!!!

6.

An animal cell is shown in Fig. 8.1.

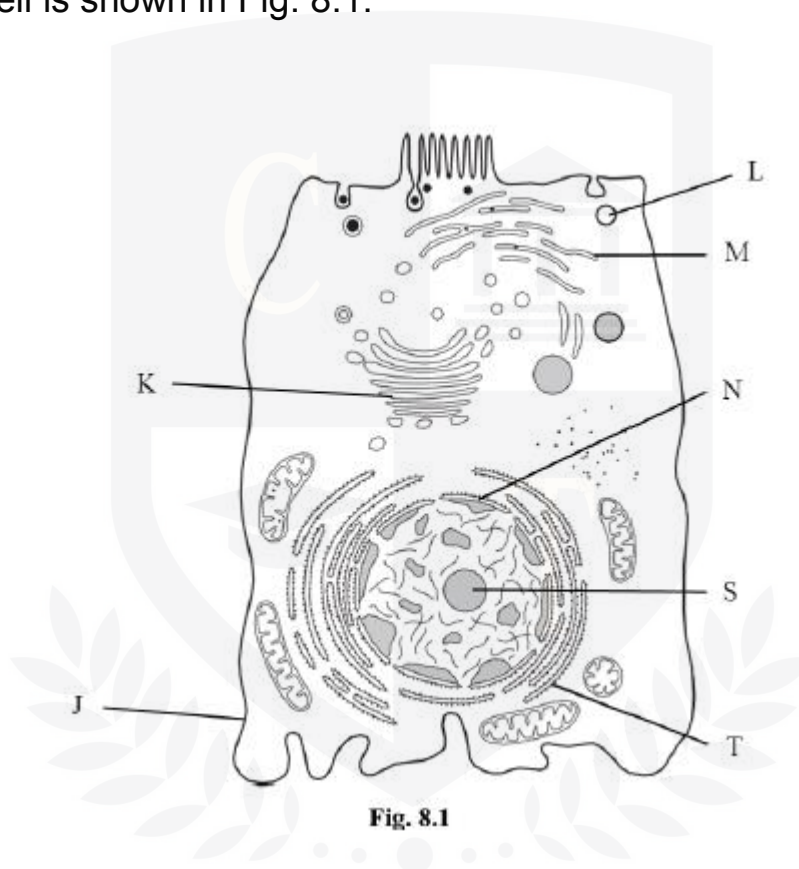


Fig. 8.1

(a) Which of the following best sums up the proper order in which the organelles in this cell produce and secrete proteins? (1)

A: S, K, L, J

B: T, K, L, J

C: T, M, L, J

D: S, T, K, L

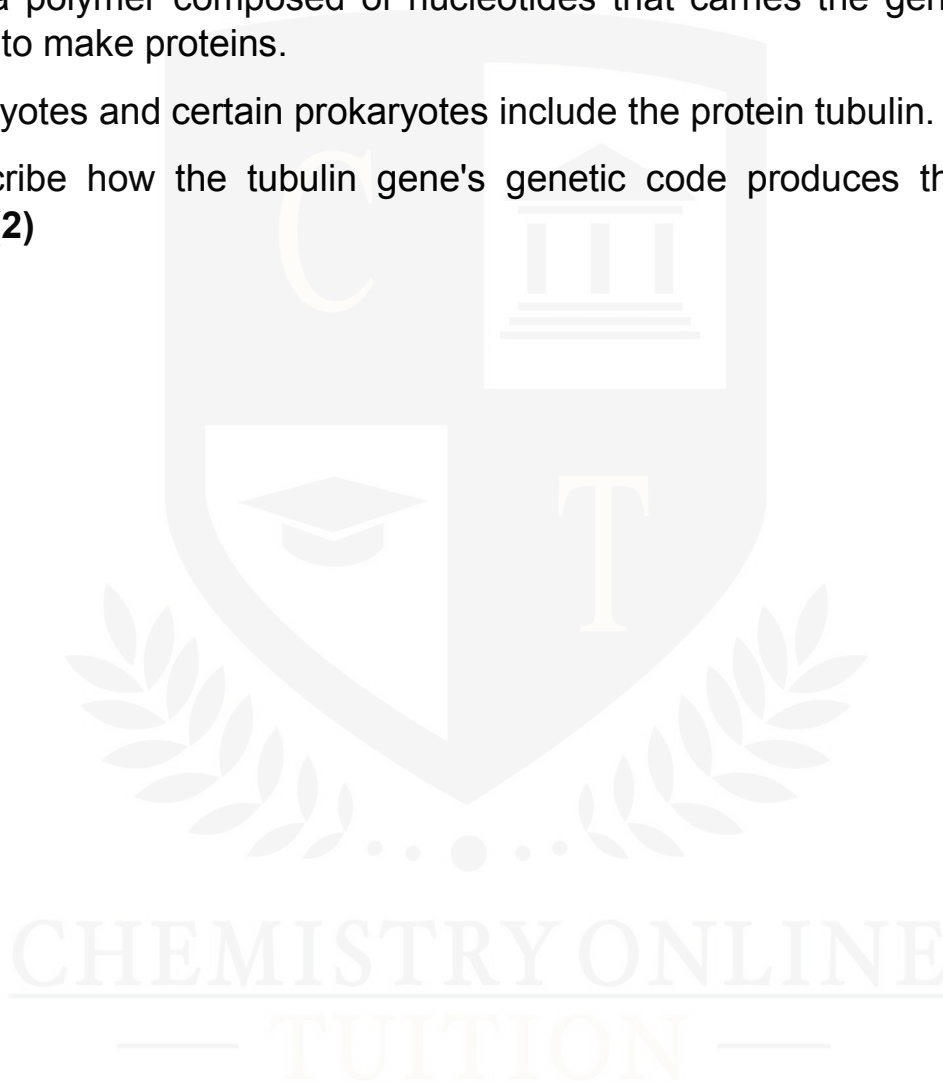


7.

DNA is a polymer composed of nucleotides that carries the genetic code required to make proteins.

All eukaryotes and certain prokaryotes include the protein tubulin.

(a) Describe how the tubulin gene's genetic code produces the tubulin protein. (2)



I am Sorry !!!!!

(b) A globular protein called tubulin has the ability to polymerise and create the cytoskeleton of cells.

The development of microtubules, which create the spindle fibers needed to move chromatids during mitosis and meiosis, is one instance of this.

Describe the cytoskeleton's three other roles in the cell. **(3)**



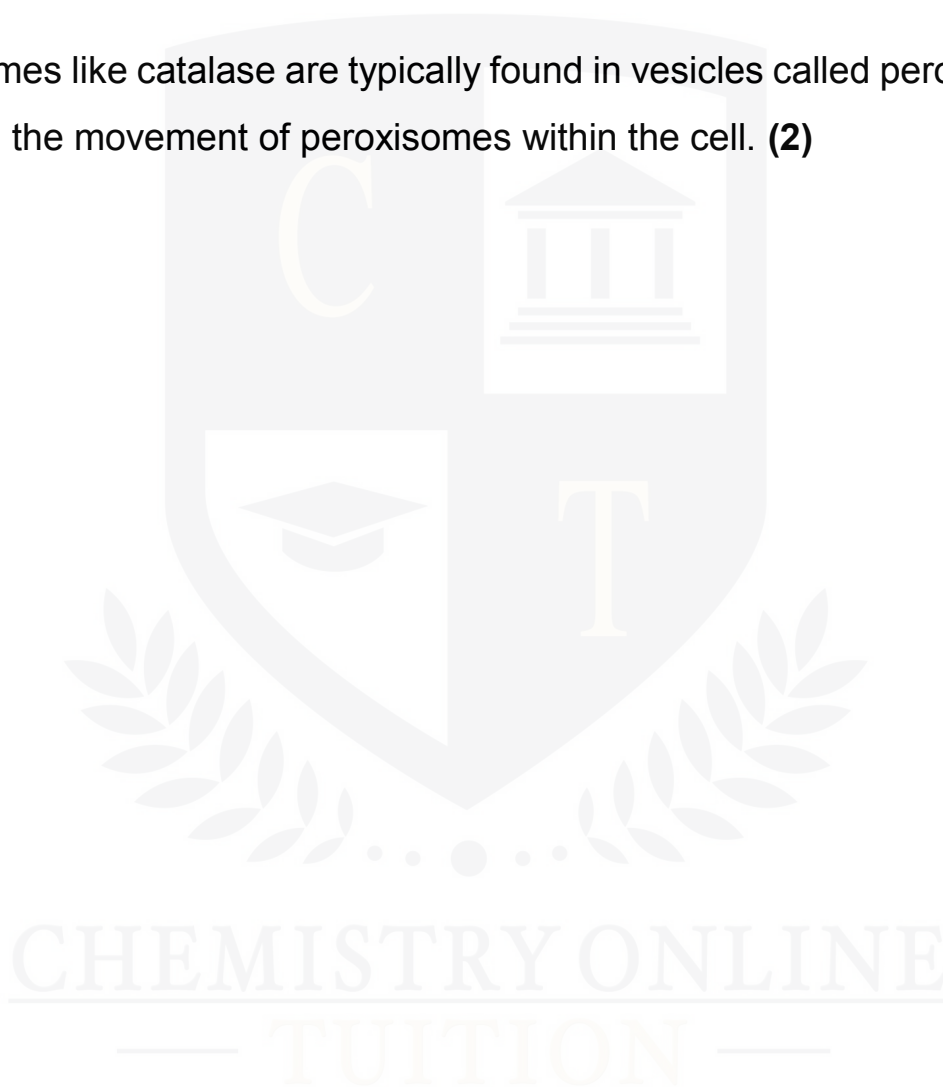
(c) Give two examples of how tubulin is necessary for eukaryotic cells' ability to synthesize and secrete proteins. **(2)**

I am Sorry !!!!!

8.

(a) Enzymes like catalase are typically found in vesicles called peroxisomes.

Describe the movement of peroxisomes within the cell. **(2)**



9.

Cells that are prokaryotic have cytoskeletons. Prokaryotic cytoskeletons include different chemicals than eukaryotic cytoskeletons do.

Three molecules found in a bacterial cytoskeleton are listed in Table 4.1.

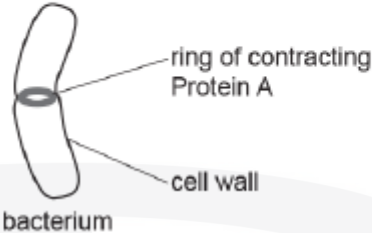
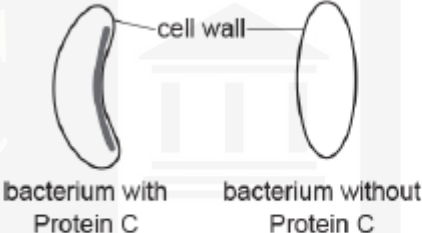
Prokaryotic cytoskeleton molecule	Information
Protein A	 <p>ring of contracting Protein A</p> <p>cell wall</p> <p>bacterium</p>
Protein B	Similar structure to actin.
Protein C	 <p>cell wall</p> <p>bacterium with Protein C</p> <p>bacterium without Protein C</p>

Table 4.1

(a) Indicate the role that Protein A plays. (2)

(b) Indicate how Protein C works. (2)

I am Sorry !!!!!

(c) Protein B binds irreversibly to an antibiotic known as A22. A22 is not utilized in humans, despite its antimicrobial qualities.

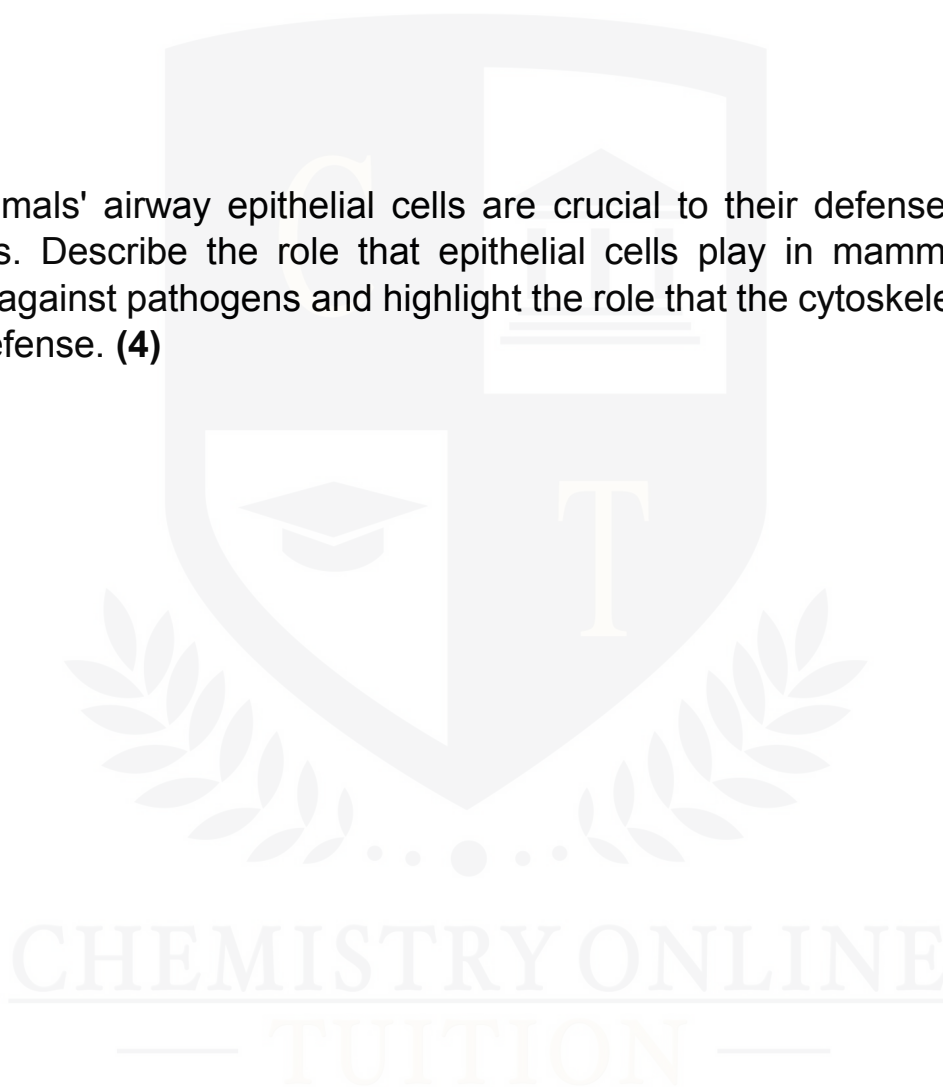
Explain the scientific community's recommendation against using A22 on people. **(2)**



10.

(a) All eukaryotic cells contain a cytoskeleton. Controlling the mobility of organelles is one of its duties. Describe the movement of organelles within the cell by the cytoskeleton. **(2)**

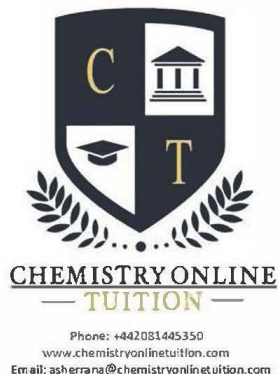
(b) Mammals' airway epithelial cells are crucial to their defenses against infections. Describe the role that epithelial cells play in mammal airway defense against pathogens and highlight the role that the cytoskeleton plays in this defense. **(4)**



I am Sorry !!!!!



DR. ASHAR RANA



- Founder & CEO of Chemistry Online Tuition Ltd.
- Tutoring students in UK and worldwide since 2008
- Chemistry, Physics, and Math's Tutor

CONTACT INFORMATION FOR CHEMISTRY ONLINE TUITION

- UK Contact: 02081445350
- International Phone/WhatsApp: 00442081445350
- Website: www.chemistryonlinetuition.com
- Email: asherrana@chemistryonlinetuition.com
- Address: 210-Old Brompton Road, London SW5 OBS, UK