

Name **one** cellular structure from the list below that is associated with each of the following functions. You must select a structure once only.

mitochondria ribosome Golgi vesicle centriole nucleus cytoskeleton

- (i) release of energy
- (ii) movement of cilia
- (iii) secrete mucus [3]

(release of energy) mitochondria ;
(movement of cilia) cytoskeleton ;
(secretion of mucus) Golgi (vesicle) ;

- (a) Complete the passage below.
- Membranes have a variety of functions in cells. All membranes are permeable. This means that they allow the passage of certain substances by processes such as active transport or through the membrane. The cell surface membrane, also known as the membrane, surrounds the cytoplasm. The cell surface membrane consists of a bilayer of To stabilise the structure of the membrane and keep it fluid, molecules of are also found in this bilayer. [5]

partially / selectively ;

(facilitated) diffusion **OR** osmosis ;

plasma ;

phospholipids ;

cholesterol ;

- (b) Membranes contain a variety of proteins. Some of these proteins are combined with carbohydrates to form glycoproteins.

Describe the functions of glycoproteins in the cell surface membrane.

- 1 (acting as) **antigens** ;
- 2 identification / **recognition**, (of cells) as, self / non-self / AW ;
- 3 **cell signalling** / described ;
- 4 **receptor** / binding site, for, **hormone** / (chemical) signal / (medicinal / named) drugs ;
- 5 ref. to **receptor** / binding site / trigger, on transport proteins / AW ;
- 6 cell **adhesion** / to hold cells together (in a tissue) ;
- 7 attach to water molecules (to stabilise membrane / cell) ;

Do not credit repetition or same point

ACCEPT foreign for non-self

ACCEPT description e.g. communication *between* cells / cell responds to, chemical / signal, *from another cell*

ACCEPT description of *attachment process* for receptor / binding site

DO NOT ACCEPT molecule unqualified

ACCEPT binding site for foreign antigen

ACCEPT ref to receptors on ion channels

ACCEPT bind to other cells for cell adhesion

(a) State **two** reasons why the blood smear has been stained.

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visible / can be seen / increase contrast ;

named example of what is now visible (after staining) ;

(b) Suggest **one** detail that would be made visible if the micrograph were taken using

(i) a scanning electron microscope

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3D shape can be seen / greater depth of field ;

can see, surface features / detail ;

(ii) a transmission electron microscope.

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smaller / named, organelle (becomes visible) ;

shapes / details of organelles ;

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Page 12 of 15