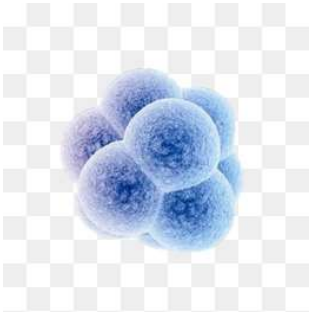
Name: Class:

Total Possible Marks: 42

Cell Differentiation and Specialisation



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1. Match the definitions to the appropriate titles:

A.	d	Sperm cells	a. These cells are specialised for contraction, they are long so that they have lots of space to contract.
B.	b	Nerve cells (in animals)	b. These cells are specialised for rapid signalling, their function being to carry electrical signals from one part of the body to another.
C.	a	Muscle cells (in animals)	c. These cells are found on the surface of plant roots and are specialised for the absorption of water and minerals.
D.	c	Root hair cells (in plants)	d. These are specialised to reproduction, and their function is to get the male DNA to the female DNA.

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2. A (a) specialised cell is one that performs a specific (b) function. Most cells in an (c) organism are specialised, and a cells structure, for example its (d) shape and the parts it contains helps it to carry out its function. For the cell to become specialised it undergoes a process known as (e) differentiation. Once a cell has become specialised (in (f) animal cells) the ability to differentiate his lost, however many (g) plant cells do not lose this ability. Cells that differentiate in mature animals are mainly used to (h) repair or replace cells such as (i) skin and (j) blood cells.

specialised	plant	blood	shape	skin
repair	organism	animal	function	differentiation

____ 1

3. Some types of differentiated cells are called stem cells, is this true or false?

* This is of course false, stem cells have not been differentiated and so have not therefore become specialised

(A) True

(B) False

3

4. Phloem and xylem cells are specialised for transporting substances. Explain, in a short paragraph how the cells achieve their function (hint: think of pipes)

* Allocate one mark for "forming tubes", allocate one mark for "long and joined end to end" and allocate one mark if the fact that they are hollow/and or containing few subcellular structures which allow substances to flow through them

The cells form phloem and xylem tubes, which transport substances such as food and water around plants. To form the tubes, these cells are long and joined end to end. Xylem cells are hollow in the centre and phloem cells have very few subcellular structures so that substances can flow through them.

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5. (a) Cells are organised as follows. Cells are the basic (b) building (c) blocks that make up all living organisms. (d) Specialised cells carry out a particular (e) function and the process by which they become specialised for a particular job is called (f) differentiation. Differentiation occurs during the (g) development of a multicellular organism. Specialised cells are (h) organised to form (i) tissues, which form (j) organs, which form organs (k) systems. Large (l) multicellular organisms have different systems inside them for (m) exchanging and (n) transporting materials.

tissues	Specialised	exchanging	building	organs
development	transporting	organised	Cells	function
systems	multicellular	differentiation	blocks	

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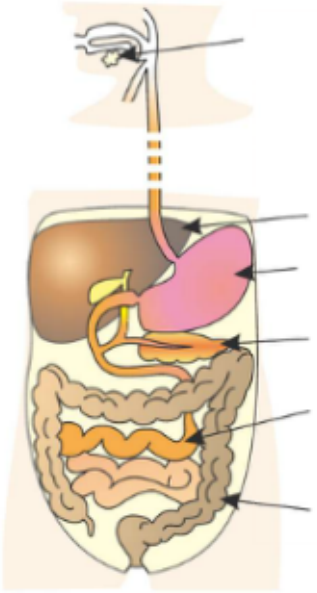
6. Tissues group together to form organs and organs group together to form organ systems.

One such organ system being the digestive system which is the system that breaks down food in human and other mammals.

Label the diagram with the name of the appropriate organ, and write down below the function of each.



A. Glands such as the pancreas and salivary glands. — These produce digestive juices

B. Stomach — Where food is digested

C. Liver — Which produces bile

D. Small intestine — Where food is digestive and soluble food molecules are absorbed

E. Large intestine — Where water is absorbed from undigested food, leaving faeces.