**Practice Exam Questions**

**1.** (a) Distinguish between diffusion and osmosis.

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(1)

(b) Explain how the properties of phospholipids help to maintain the structure of the cell surface membrane.

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(2)

(c) State the composition and the function of the plant cell wall.

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(2)

(Total 5 marks)

**2.** State **one** function of each of the following organelles.

 Lysosome…………………………………………………………………  
 Golgi apparatus……………………………………………………………  
 Rough endoplasmic recticulum……………………………………………  
 Nucleus……………………………………………………………………  
 Mitochondrion…………………………………………………………….

(Total 5 marks)

**3.** (a) An organelle is a discrete structure within a cell with a specific function. In the table below, identify the missing organelles and outline the missing functions.

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| --- | --- | --- |
| **Name of  organelle** | **Structure of organelle** | **Function of organelle** |
| Nucleus | Region of the cell containing  chromosomes, surrounded by a double membrane, in which there are pores. | Storage and protection of chromosomes |
| Ribosome | Small spherical structures,  consisting of two subunits. | ..........................................................  ..........................................................  .......................................................... |
| .................. | Spherical organelles, surrounded  by a single membrane and  containing hydrolytic enzymes. | Digestion of structures that are not needed within cells. |
| .................. | Organelles surrounded by two  membranes, the inner of which is  folded inwards. | ..........................................................  ..........................................................  .......................................................... |

(4)

(b) The table above shows some of the organelles found in a particular cell. Discuss what type of cell this could be.

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(2)

(Total 6 marks)

**4.** (a) Explain how the surface area to volume ratio influences cell sizes.

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(3)

(b) State **one** function for each of the following organelles.

(i) Ribosomes

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(ii) Rough endoplasmic reticulum

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(iii) Golgi apparatus

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(3)

(c) Compare prokaryotic and eukaryotic cells in regards to **three** different features.

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|  | **Prokaryotic** | **Eukaryotic** |
| **1.** | ...........................................................  ........................................................... | ...........................................................  ........................................................... |
| **2.** | ...........................................................  ........................................................... | ...........................................................  ........................................................... |
| **3.** | ...........................................................  ........................................................... | .  ..........................................................  ........................................................... |

(3)

(Total 9 marks)

**5.** (a) Define the term *active site* of an enzyme.

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(1)

(b) Outline how enzymes catalyze biochemical reactions.

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(2)

(c) Explain the effect of pH on enzyme activity.

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(3)

(d) State **three** functions of lipids.

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(2)

(Total 8 marks)

**6.** The diagrams below show various molecular structures.



(a) Identify which of the diagrams represent

(i) the structure of glucose;

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(1)

(ii) the structure of amino acids;

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(1)

(iii) the structure of fatty acids.

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(1

(b) Discuss which of the molecules are most similar in structure.

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(3)

(Total 6 marks)

**7.** The following diagram represents replication in DNA.



[Freeman, Scott, Biological Science, 1st,  2002. Electronically reproduced by permission of Pearson Education, Inc.,  
Upper Saddle River, New Jersey]

(a) State the name and describe the function for the enzymes labelled A and B on the diagram.

(i) A: Name: ..........................................................................................

Function: ..........................................................................................

(ii) B: Name: ..........................................................................................

Function: ..........................................................................................

(2)

(b) Identify the cellular location of DNA replication in eukaryotic cells.

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(1)

(c) State at which period during the cell cycle DNA replication occurs.

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(1)

(d) Explain the significance of complementary base pairing during DNA replication.

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(2)

(Total 6 marks)

**8.** Outline the use of carbohydrates and lipids in energy storage.

(Total 5 marks)

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**9.** *Up to two additional marks are available for the construction of your answers.*

(2)

(a) Draw and label a diagram of the ultrastructure of a liver cell.

(4)

(b) Explain how mitosis produces two genetically identical nuclei.

(8)

(c) Outline **one** therapeutic use of stem cells.

(6)

(Total 20 marks)

**10.** Which phases of mitosis are shown in diagrams I and II?



I II

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| --- | --- | --- |
|  | **I** | **II** |
| A. | metaphase | prophase |
| B. | metaphase | telophase |
| C. | anaphase | prophase |
| D. | anaphase | metaphase |

(Total 1 mark)