Practice Question Set For A-Level
Subject : Biology
Paper-1 Topic:1 Biological Molecules

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The human papilloma virus contains a double-stranded DNA genome.

(a) Which components are found in a human papilloma virus?

Tick ✓ **one** box.

Capsid and attachment protein	☐
Capsid, attachment protein and reverse transcriptase	☐
Capsule and attachment protein	☐
Cell-surface membrane and attachment protein	☐

(1)

(b) The DNA-replication enzymes of a human cell make copies of the human papilloma virus genome.

Name **two** enzymes that are involved in replicating the DNA of the human papilloma virus and describe their roles in the replication process.

Name of enzyme 1 _____

Role of enzyme 1 _____

_____

_____

Name of enzyme 2 _____

Role of enzyme 2 _____

_____

_____

(3)

(c) Human papilloma virus infects cells that are no longer dividing. The human papilloma virus genome contains genes that code for proteins that cause human cells to restart their cell

Downloaded from www.merit-minds.com

cycles.

Human papilloma virus infection can cause cancer.

Explain why.

_____

_____

_____

(1)

(d) Human papilloma virus (HPV) is transmitted through sexual contact.

More than 95% of cervical cancers (which only affect females) are due to HPV infection. HPV infection of other tissues increases the risk of cancer but this is rare compared with cervical infection.

A vaccine is available that is over 80% effective at preventing HPV infection, if given before the person has been exposed to HPV. There is evidence of herd immunity when more than 50% of the population have been vaccinated.

Evaluate whether 10- to 12-year-old boys should be given the HPV vaccine.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(4)

(Total 9 marks)

Downloaded from www.merit-minds.com

Q2.

Read the following passage.

Carbohydrates are moved by mass transport in plants and in mammals. This movement is caused by a pressure gradient inside the transport vessels.

Plants transport most of their carbohydrate as sucrose. The phloem has sucrose-transport proteins in the cell-surface membrane. Potato plants with fewer sucrose-transport proteins produce fewer potatoes and accumulate sugars in their leaves.

Mammals do not have sucrose-transport proteins in their cell-surface membranes. They do have many monosaccharide-transport proteins in cell-surface membranes. These transport proteins allow monosaccharides through by facilitated diffusion.

Mammalian cells can change the number of glucose-transport proteins in their cell-surface membranes. The glucose-transport proteins are stored in internal membranes, then moved to the cell-surface membrane when they are needed. During exercise, there is a significant increase in glucose uptake by muscle cells.

Use the information in the passage and your own knowledge to answer the following questions.

(a) Explain how sucrose-transport proteins in leaf cells enable the production of a pressure gradient in the phloem.

(3)

(b) Potato plants with fewer sucrose-transport proteins produce fewer potatoes and accumulate sugars in their leaves (lines 4, 5 and 6).

Explain why.

Downloaded from www.merit-minds.com

_____

(2)

(c) During exercise, there is a significant increase in the glucose uptake by muscle cells (lines 14 and 15).

Give **two** reasons why glucose uptake by muscle cells increases significantly during exercise.

Explain your answers.

1 _____

_____

_____

_____

_____

_____

2 _____

_____

_____

_____

_____

_____

(4)

(d) Which statement correctly describes the structure of both a sucrose-transport protein and a glucose-transport protein?

Tick ✓ **one** box.

The secondary structure is held by disulfide bridges.
The tertiary structure allows the protein to be positioned on the inner surface of the cell membrane. ☐

The secondary structure is held by disulfide bridges.
The tertiary structure allows the protein to be positioned spanning the whole cell membrane. ☐

The secondary structure is held by hydrogen bonds.
The tertiary structure allows the protein to be positioned on the outer surface of the cell membrane. ☐

The secondary structure is held by hydrogen bonds.
The tertiary structure allows the protein to be ☐

Downloaded from www.merit-minds.com

positioned spanning the whole cell membrane.

(1)
(Total 10 marks)

Downloaded from www.merit-minds.com