

Year 12 Biology HSC

Sample Questions

This is NOT a complete sample examination paper.

This document shows the layout of the 2019 Year 12 Biology HSC Diagnostic Topic Tests and provides some sample questions from the tests.

TEST 11 SAMPLE QUESTIONS

Question 1

Which row in the following table correctly describes mutation in somatic and germ cells?

	Somatic cell	Germ cell
A.	The mutation occurs in the reproductive cells of organisms.	The mutation occurs in the non-reproductive cells of organisms.
B.	The mutation occurs in the ova or sperm but is not inherited.	The mutation occurs in the reproductive tissue and is inherited.
C.	The mutation occurs in the non-reproductive cells of the body.	The mutation occurs in the reproductive cells of the body.
D.	The mutation is caused by an environmental factor in the cells of the body.	The mutation is caused by a virus or bacteria in the cells of the body.

Question 2

What are the processes of meiosis that increase genetic variation in a population?

- A. crossing over and random segregation of chromosomes
- B. random segregation of chromosomes and fertilisation
- C. DNA replication and cytokinesis
- D. crossing over and fertilisation

Question 3 (6 marks)

A student is investigating current research on ovarian cancer. They know that the ovary is a reproductive organ and want to find out if a person who has ovarian cancer is more likely to have children who will have ovarian cancer.

- a. State an inquiry question that could be the starting point of the student’s research. 1 mark

- b. Describe the type of data the student would obtain while researching this topic. 2 marks

- c. The student investigated where cancer forms in the ovary and found the following data.

Type of ovarian cancer	Percentage of all ovarian cancers (%)
Epithelial cancer	80
Germ cell (produced in the egg-producing cells of the ovary)	4
Other	16

The student also found that about 10% of women who get ovarian cancer may have inherited the gene for their cancer.

The student decides that the information is inconsistent, as they expected that if 10% of women who get ovarian cancer inherit it, then 10% of ovarian cancer should be germ cell ovarian cancer. The student decides that the source of information is unreliable.

- Do you agree with the student’s assessment of the information? Justify your position. 3 marks

TEST 13 SAMPLE QUESTIONS

Refer to the following information to answer Questions 2 and 3.

Louis Pasteur conducted experiments that disproved the theory of spontaneous generation. He boiled beef broth in glass flasks called swan-necked flasks. They are called this because the thin tube at the top is bent like a swan's neck.

Question 1

What was the role of the beef in Pasteur's experiments?

- A. The beef provided nutrients for any microbes present in the broth prior to boiling.
- B. The beef provided nutrients for any microbes that came in contact with the broth after boiling.
- C. The beef provided a sterile environment to prevent growth of microbes.
- D. The beef provided nutrients for any microbes trapped in the bent opening of the flask.

Question 2

Which statement best describes the significance of Pasteur's findings in relation to infectious disease?

- A. In order for an organism to have a disease, they must be infected with a pathogen.
- B. An organism only has a disease if the pathogen is present in sufficient doses.
- C. An organism can become infected with a pathogen when they have not had direct contact with an infected organism.
- D. Inherited disease can skip generations if the gene for the disease is recessive.

Question 3 (3 marks)

A student has been asked to design and conduct an experiment to test for the presence of microbes in different samples of water.

- a. Describe the type of data the student would obtain from the experiment described above. 1 mark

- b. Outline how the student could improve the reliability and validity of the experiment. 2 marks

TEST 15 SAMPLE QUESTIONS

Question 1

The retina in the eye has sensory tissue that detects light. The optic nerve sends information to the occipital lobe in the brain.

Which nervous system does the optic nerve belong to?

- A. sensory nervous system
- B. central nervous system
- C. motor nervous system
- D. physiological nervous system

Question 2

A person has been on a three-hour hike. They did not eat anything during this time.

Which one of the rows in the following table correctly identifies how the pancreas and liver would help restore homeostasis after the hike?

	Pancreas	Liver
A.	releases insulin	takes up glucose and stores it as glycogen
B.	releases glucose	takes up glycogen and stores it as glucose
C.	releases glycogen	breaks down glucose and releases it as insulin
D.	releases glucagon	breaks down glycogen and releases glucose

Question 3 (6 marks)

- a. Identify the TWO types of effectors in organisms. 1 mark

- b. Identify ONE type of effector and describe its role when responding to change. 2 marks

END OF SAMPLE QUESTIONS