

2016 Study Guide HSC

Biology Trial Exam

The Test

The examination will have a reading time of 5 minutes and a working time of 3 hours. It is in three parts:

Section I: all questions must be attempted

Part A: 20 multiple choice questions (multiple choice answer sheet)

Part B: short answer and longer response questions (answered on the exam paper)

Section II

Choose ONE of the option questions. Our option is Communication. These questions are short answer and longer response and answers will be written on the paper provided.

Revision

You should revise all the work you have covered in the HSC year and pay particular attention to:

Biology Skills:

- Determine the type of data that needs to be collected and explain the qualitative or quantitative analysis that will be required for this data to be useful
- Demonstrate the use of terms “dependent” and “independent” to describe variables involved in the investigation
- Selecting and drawing appropriate graphs to convey information and relationships clearly and accurately
- Assess reliability of first-hand and secondary information and data by considering information from various sources
- Assess the accuracy of scientific information presented in mass media by comparison with similar information presented in scientific journals
- Apply critical thinking in the consideration of predictions, hypotheses and the results of investigations
- Identify and explain how data supports or refutes an hypothesis, a prediction or a proposed solution to a problem
- Evaluating the appropriateness of different strategies for solving an identified problem

Maintaining a Balance:

- Identify the pH as a way of describing the acidity of a substance
- Feedback mechanism
- Identify the form(s) in which each of the following is carried in mammalian blood
 - Carbon dioxide
 - Oxygen
 - Water
 - Salts
 - Lipids
 - Nitrogenous waste
 - Other products of digestion
- Calculate the size of red blood cells
- Current technologies that allow measurement of oxygen saturation and carbon dioxide concentrations in blood
- Mammalian kidney
- Compare and explain the differences in urine concentration of terrestrial mammals, marine fish and freshwater fish
- Choose equipment or resources to perform a first-hand investigation to gather first-hand data to draw transverse and longitudinal sections of phloem and xylem tissue
- Renal dialysis

Blueprint of life

- Describe, using specific examples, how the theory of evolution is supported by the following areas of study:
 - Palaeontology, including fossils that have been considered as transitional forms
 - Biogeography
 - Comparative embryology
 - Comparative anatomy
 - Biochemistry
- Explain how Darwin/Wallace's theory of evolution by natural selection and isolation accounts for divergent evolution and convergent evolution
- Phenotype
- Construct a model that demonstrates meiosis and the processes of crossing over, segregation of chromosomes and the production of haploid gametes
- Solve problems involving monohybrid crosses using Punnett squares or other appropriate techniques
- Solve problems involving co-dominance and sex-linkage
- Describe the work of Morgan that led to the understanding of sex linkage
- Describe the process of DNA replication and explain its significance
- Outline the evidence that led to Beadle and Tatum's "one gene – one protein" hypothesis and explain why this was altered to the "one gene – one polypeptide" hypothesis

Search for Better Health

- The historical development of our understanding of the cause and prevention of malaria
- Role of quarantine in preventing the spread of disease and plants and animals into Australia or across regions of Australia
- Perform an investigation to model Pasteur's experiment to identify the role of microbes in decay
- Antibiotic resistance
- Identify the components of the immune response:
 - Antibodies
 - T cells
 - B cells
- Explain why organ transplants should trigger an immune response
- Identify causes of non-infectious disease using an example from each of the following categories:
 - Inherited diseases
 - Nutrient deficiencies
 - Environmental diseases
- Outline the way in which vaccinations prevent disease
- Epidemiological studies involve the collection and careful statistical analysis of large quantities of data. Such studies assist the causal identification of non-infectious diseases

Communication

- Describe the anatomy and function of the human eye, including the
 - Conjunctiva
 - Sclera
 - Choroid
 - Retina
 - Iris
 - Lens
 - Aqueous and vitreous humor
 - Ciliary body
 - Optic nerve
- Identify accommodation as the focusing on objects at different distances, describe its achievement through the change in curvature of the lens and explain its importance
- Model the process of accommodation by passing rays of light through convex lenses of different focal lengths
- Compare and describe the nature and functioning of photoreceptor cells in mammals, insects and one other animal
- Describe and analyse the use of colour for communication in animals and relate this to the occurrence of colour vision in animals
- Describe the anatomy and function of the human ear, including:
 - Pinna
 - Tympanic membrane

- Ear ossicles
- Oval window
- Round window
- Cochlea
- Organ of Corti
- Auditory nerve
- Outline and compare the detection of vibrations by insects, fish and mammals
- Explain that the response to a stimulus involves:
 - Stimulus
 - Receptor
 - Messenger
 - Effector
 - Response
- Identify and demonstrate how technologies help correct specific biological problems associated with human communication

Also:

Obviously, revise your notes

Go through the syllabus and write responses (even in point form) to test yourself

Practise questions from past papers - use I.D. E. A/E to give yourself a scaffold to write answers to questions

Hand all you do in to be looked at by me or Mr Morrissey

Make good use of class revision time – be engaged and have a go at answering questions – you can learn a lot by making mistakes and this class is a lovely one to safely make mistakes in

Be organised, be committed, keep a clear head and make an honest effort and enjoy showing off what you know

Eat well, rest well, exercise and be nice to your family and friends