

The University of Waikato
Bachelor of science - Major in ecology and biodiversity - 3rd year

Practice exam questions - BIOEB203 animal structure and function

Describe how the summation of electrical potentials from gated ion channels changes the membrane potential of an excitable cell to generate an action potential?

Describe the transmission of the action potential along an axon and across a synapse to excite a postsynaptic cell?

Describe the diversity of semiochemical signaling that occurs between organisms - both interspecific and intraspecific?

Describe the general properties of sense organs including signal transduction and amplification, frequency response, threshold and saturation?

Describe the structure and function of the vertebrate ear, including the detection of head position, movement and sound?

Describe the physiology of the vertebrate skeleton muscle including the regulation of contraction, the recruitment of motor units, summation of twitch contractions and the different metabolic types of muscle?

Compare and contrast the energetic costs of locomotion in water, in the air and on land?

What advantages and disadvantages are associated with locomotion in each of these environments and what specializations do animals show that assist in reducing energetic costs?

Describe open versus closed circulatory systems in animals, single versus double closed circulations (e.g. fish vs mammals), and how hearts, valves and compliant blood vessels generate pressure to move blood.

describe how blood pressure and osmotic pressure are involved in the exchange of substances within tissues.

Discuss the general structure and function of respiratory pigments and the detailed structure and function of hemoglobin?

Describe the oxygen binding properties of hemoglobin and the many factors that influence hemoglobin oxygen affinity and enhance oxygen delivery to metabolizing tissues?

Define the aerobic dive limit (ADL) of diving vertebrates and discuss the adaptations of vertebrate divers that increase the ADL by maximizing O₂ storage and minimizing O₂ use when diving?

Describe the effect that body mass has on mass-specific metabolic rate in animals and the many other factors that affect basal or resting metabolism?

Define regional and temporal heterothermy and any constraints on the body mass of temporal heterothermy?