

# YEAR 11 BIOLOGY

## Preliminary Mid-Course Examination 2009

### EXAMINATION MARKING GUIDE

#### PART A: MULTIPLE CHOICE

1*	A/D
2	C
3	A
4	C
5	A
6	D
7	B
8	B
9	B
10	D
11	D
12	A
13	B
14	B
15	C
16	D
17	A
18	D
19	C
20	D

\*Two choices, A and D can be considered correct for this question.

#### PART B: SHORT ANSWER QUESTIONS

21. a) Mitochondria  
 b) The mitochondrion converts the energy stored in glucose into ATP (adenosine triphosphate) for the cell during a process called respiration.
22. – The word equation for photosynthesis is:  
 • Carbon dioxide + Water  $\xrightarrow{\text{sunlight + chlorophyll}}$  Glucose + Oxygen
23. – The general equation for aerobic cellular respiration is:  
 • Glucose + Oxygen  $\xrightarrow{\text{sunlight}}$  Carbon Dioxide + Water + Energy
24. a) An adaptation is an acquired characteristic that increases an organism's likelihood of survival and reproduction relative to organism that lack the characteristic  
 b) Marker's individual discretion
25. **Sample Table** (1 mark per row, 2 rows required, 1 mark for table design)

Characteristic	Aquatic Environment	Terrestrial Environment
Buoyancy	Water has a high level of buoyancy	Low level of buoyancy.
Chemical: Carbon Dioxide	Carbon dioxide solubility is low in water, but is more dissolved at low temperatures than at high.	Little presence of CO <sub>2</sub> .
Chemical: ions	Generally, the concentration of ions outside of marine animals is higher than inside and they lose water by osmosis..	The availability of specific ions can vary widely.
Chemical: oxygen	Oxygen has low solubility is water but is more soluble in cold water and is thus more available in colder waters.	Oxygen is rarely a limiting factor in terrestrial environments.

Chemical: water	High presence of water.	Water availability varies alot in terrestrial environments.
Light	Light penetration decreases with depth.	Generally light is not a limiting factor.
Pressure	Pressure increases with depth.	Pressure has little effect on most animals.
Temperature	Temperature of water has a specific heat and will absorb large amounts with little change in temperature.	Temperature changes in terrestrial environments are much large than in aquatic environments.
Viscosity	Water has high viscosity.	Air has a low level of viscosity.

- 26.** – Air levels in aquatic environments generally decrease with depth  
– The most adequate amount of food is located at deep depths where air levels are low  
– Therefore the action of the Dytiscid beetle swimming to the surface for an air bubble allows it to swim to deep depths to gather food sources and survive using the air bubble  
– When the air bubble runs out the beetle will return to the surface to capture a new bubble of air

**27. a)**

Quadrat	Melanertia	Austrocochlea	Crab
1	5	3	0
2	1	1	3
3	1	3	2
4	5	1	1

**b)** Density =  $6 \div (4 \times 1) = 1.5$  Austrocochlea per quadrat

**c)** Estimate =  $1.5 \times 19.2 = 28.8$  Austrocochlea estimation in whole area

**d)** Number of Austrocochlea in whole area = 32

**e)** % deviation =  $(28.8 - 32) \div 32 \times 100\% = -3.75\%$  deviation

- f)** – When the difference between estimated and actual total is small, results are fairly accurate due to only a small amount of error in estimation  
– A small amount of deviation means that the method of estimation provides results near the actual number and the estimation if a very accurate way to carry out estimations

**28.** – Name species being studied (1 mark)

– Define abundance (1 mark)

– Name and describe method(s) (2 marks)

– Explain any disadvantages associated with each method (2 marks)