**Edwest Examination, 2015**

BIOLOGY

YEAR 11

SOLUTIONS

1. B

2. C

3. B

4. D

5. A

6. D

7. B

8. C

9. A

10. A

11. D

12. B

13. C

14. D

15. C

16. A

17. D

18. A

19. D

20. B

21. A

22. C

23. C

24. D

25. B

26. A

27. B

28. D

29. B

30. C

31.

(a) (i)

Blue Wrens

Predatory Spiders Mushroom fungus

Native Parrots Beetles

Wild Grass Jarrah Tree

(2)

(ii) Native Parrots, Beetles, Predatory spiders, Blue Wrens (1)

(iii) Predatory Spiders (1)

(b) (i) Correct shape (1), correct scale (1)

(ii) Most biomass that enters a trophic level is lost as heat(1)

Due to respiration (1)



(c) (i) Mushrooms are decomposers (1) that breakdown dead/wastes/organic

matter to inorganic matter (1)

(ii) These take in Carbon Dioxide and Water for glucose production/photosynthesis (1)

Also take in minerals as building blocks for biomass (1)

(d) (i) Decrease in biomass (1) / add nutrients to soil (1) / decrease

In biodiversity (1) / result in native seed germination (1)

Any 2 = two marks

(ii) Increased competition (1) / decrease in biodiversity (1)

(e) Creation of National Park (1) Regeneration/reforestation (1)

32.

(a) (i) Eukaryote (1)

Nucleus present / internal membrane –bound organelles (1)

(ii) Animal cell (1)

Lacks a large vacuole / cell wall / chloroplasts (1)

(b) A: Aerobic Respiration (1)

Glucose + Oxygen Carbon Dioxide + Water (1)

B: Anaerobic Respiration (1)

Glucose Lactic Acid (1)

(c) Cell membrane (1)

Bi-phospholipid layer (1)

Proteins embedded in phospholipids (1)

Hydrophyllic heads and hydrophobic tails (1)

Proteins can be receptors/channel/facilitated diffusion/active transport (1)

Any 3 = 3 marks

(d) (i) Glucose and sodium (1)

(ii) Greatest concentration difference (1)

(iii) Gain water (1)

Water move from la region of low solute concentration outside the cell to a region of high solute concentration inside the cell (1)

(e) Surface Area: volume ratio decreases (1)

Cells can: divide (1), increase no. of surface projections (1), adopt a flattened shape (1)

33.

(a) (i) Hypothesis 1: Using a fertiliser (1) will increase carrot biomass (1)

Hypothesis 2: Liquid fertiliser will increase carrot biomass (1) more

than a granule fertiliser (1)

(ii) Hypothesis 1: The use of a fertilser (1)

Hypothesis 2: Type of fertiliser (1)

(iii) Biomass of carrot (1)

(b) Neat and accurate (1)

Key (1)

Suitable title (1)

Axes labelled correctly (Y-axis: muscle protein; X-axis: months(1)

Axes labelled with correct units(1)

(c) Fertiliser increase carrot biomass (1)



Granulated fertiliser will increase carrot biomass better than liquid fertiliser (1)

Liquid fertiliser works better in the first three months (1)

(d) (i) Avoid results due to error (1) or chance (1)

(ii) Acts as a control procedure (1) a comparison for effect of fertiliser (1)

(e) Students must make an effort to control all variables (1)

This means to make sure that the growing conditions are the same as for previous procedures (1)

Variables to control would include: soil (1) or water (1) or light (1)or density of planting (1) Any 2 = 2 marks

34.

(a) Structure A is phloem (1)

that transports sugars within the plant / translocation(1)

Structure B is xylem (1)

That transports minerals and water within the plant (1)

(b) Structure A: sieve plates (1) or sieve tubes (1) or companion cells (1)

Any 2 = 2 marks

Structure B: lignin (1) and pits (1)

(c) (i) Transport requires energy (1)

Energy provided by companion cells/sieve tube cells (1)

Sugars moved from leaves/storage areas to areas of need (1)

Any 2 = 2 marks

(ii) Osmosis (1) Root pressure (1) Capillarity (1) Evaporative pull (1)

Any 2 = 2 marks

.

(d) (i) Cuticle (1) that prevents water loss (1)



(ii) Guard cell (1) controls aperture of stomate/water loss (1)



(e) Thick cuticle (1) reduce water loss by evaporation (1)

Hairy leaves (1) reduces air movement/traps moisture (1)

Sunken stomates (1) reduces air movement/traps moisture (1)

Any 2 pairs = 2 marks

35.

(a) Ecological succession involves changes in populations in an ecosystem (1)

Particular species colonise and alter the abiotic/biotic conditions (1)

This can make the conditions more suitable for other species (1)

These species can then move in and become established (1)

(b) Quadrat sampling (1)

Allocation of quadrats at random (1)

Quadrat size determined by size of species / size of area (1)

No of individuals counted per quadrat (1)

Use of formulae:

Population size = Total area x no. per quadrat

Area of quadrat (1)

Any 4 = 4 marks

(c) (i) Increase due to lack of predators (1) excess territory (1)



abundant resources (1) lack of competition (1)

Any 2 = 2 marks

(ii) Increased competition (1) overcrowding (1) loss of resources (1) increased predation (1) carrying capacity reached (1)

Any 2 = 2 marks

(d) (i) Carrying capacity (1)

The maximum population that can be supported by an ecosystem without it leading to environmental degradation (1)

(ii) Available resources such as: water (1), territory (1), food (1)

Any 2 = 2 marks

(e) A number of individuals are captured (1)

Captured individuals are tagged (1)

Captured individuals are released (1)

A recapture occurs (1)

The number of tagged individuals in recapture are compared to the number of untagged (1)

The formulae used is:

Population size = Initial capture and tag x no. in recapture

no. tagged in recapture (1)

. Any 4 = 4 marks

SECTION 3



36.

(a) Matter is re-cycled between the biotic and abiotic environment (1)

For example, in the carbon cycle:

Carbon is removed from the abiotic environment by plants (1)

during photosynthesis (1) carbon dioxide converted to glucose (1)

Carbon is returned to the abiotic environment as carbon dioxide (1)

during respiration (1)

Bacteria act as decomposers (1) converting organic carbon to inorganic carbon dioxide (1)

Fossil fuels and other organic fuels are burnt and combustion (1)

Converts organic carbon to inorganic carbon dioxide (1)

(b) Energy enters the ecosystem as light (1)

During photosynthesis (1)

Plants convert this to chemical energy (1) in the form of glucose (1)

Glucose used in respiration (1) to produce energy to manufacture larger

organic molecules/plant tissue (1)

Most chemical energy is lost as heat in respiration (1) up to 90% is lost (1)

Some chemical energy will enter ecosystem as a result of immigration (1)

And will be lost as part of emigration of individuals (1)

37.

(a) Decrease biodiversity through:

Habitat destruction (1) due to mining/housing/farming crops (1)

High levels of pollution (1) such as greenhouse effect/heavy metals/eutrophication (1)

Unrestricted hunting seasons (1)

Restore biodiversity through:

Gene/seed banks (1)

The creation of national parks and refuges (1)

Reducing hunting seasons (1)

Legislation that controls habitat destruction (1)

Captive breeding programmes (1)

(b) Relationships include:

Competition (1) individuals require the same resources (1)

Predation (1) one individual consumes another individual (1)

Parasitism (1) one individual lives off another individual without

consuming it (1)

Mutualism (1) two individuals live in close association and

benefit each other (1)

Commensalism (1) two individuals live in close association in which one benefits and the other remains unaffected (1)

Saprophitism (1) one individual lives off the dead remains of another (1)

Any 5 pairs = 5 marks

38.

(a) Gas exchange occurs when oxygen from the environment is absorbed

and carbon dioxide is released to the environment (1)

It occurs by diffusion (1)

across a gas exchange surface that is:

Thin (1)

Moist (1)

Large surface area (1)

Richly vascularised (1)

Arthropod: Occurs through spiracles/tracheal system (1)

Pumping by abdomen assist ventilation (1)

Mammal: Occurs across internal lungs/alveoli (1)

Breathing a result of diaphragm (1)

(b) Inputs for all cells include: Oxygen (1) Water (1) Mineral ions (1)

Outputs for all cells include: Carbon dioxide (1) Water (1)

Nitrogenous wastes/urea (1)

Factors that affect exchange include

Concentration difference / gradiant (1), Size of materials (1)

Surface area: Volume ratio of cells (1), Charge of materials (1)

39.

(a) Enzymes are proteins (1) that increase the rate of a reaction (1)

Enzymes have a specific shape (1)

That will attach to a substrate at an active site (1)

Substrates are the substances upon which an enzyme acts (1)

Enzyme-substrate complex formed (1)

Enzymes lower the activation energy needed to complete a reaction (1)

Enzymes require specific conditions (1)

Any 7 = 7 marks

Factors affecting enzyme action include:

Temperature (1), pH (1), Concentration of enzymes/substrates (1)

Presence of co-enzymes/co-factors (1)

Any 3 = 3 marks

(b) Active Transport (1)

Use membrane carrier proteins (1)

To move substances from low concentration to high concentration (1)

Endocytosis (1) will move large substances into the cell (1)

Cell membrane surrounds/engulfs (1)

Forms a vesicle that moves into cell (1)

Exocytosis (1) moves substances out of the cell (1)

Vesicle fuses with cell membrane to release contents (1)