Important Definitions

Chemiosmosis: the diffusion of hydrogen ions across the membrane down electrochemical/concentration gradient to produce ATP.

Absorption spectrum: shows absorption of light of different wavelengths.

Action spectrum: Rate of photosynthesis at different wavelengths of light.

Gene pool: all the alleles in a population.

Allele Frequency: the proportion of /number of times occuring for one allele within a gene pool.

Biomass: How much organic matter is present in an organism.

Biodiversity: number of different species.
genetic diversity within a species.

Population: members of same species living in the same place at the same time.

Community: a group of different species/populations interacting in a particular area/living in same area at the same time.

Ecosystem: organisms interacting with each other and with abiotic factors.

Abiotic factors: Non-living factors [light intensity / temperature].

Biotic factors: The living elements of the habitat that affect the ability of a group to survive. [predation / disease].

Edaphic factors: the physical, chemical and biological properties of soil.

Habitat: Place that provides food & shelter for living organisms / the place where organisms live.

Niche: Role of the organisms in its habitat and how it interacts with its environment.

Abundance: the number of a particular organism.

Distribution: where the organisms are found.

Ecological succession: series of changes that occur to the composition of species in the community of organisms over a period of time.

Climax community: Final stage of succession / community that has reached to a steady state. Gradually larger plants can be supported and the diversity & species increase resulting in increasing animals diversity.

Pioneer species: First organisms that colonise an area and are adapted to sever conditions.

Trophic level: the feeding level / energy level in a food chain.

GPP: the organic matter produced as a result of energy production in plants from photosynthesis.

NPP: organic material/energy available for next trophic level in plants.

Global warming: increase in average temperature of the Earth's surface.

Anthropogenic climate change: changes to weather patterns over a long period of time due to human activity.

Climate: the average weather in a relatively large area.

Weather: the condition in the atmosphere at one particular time.

Dendrochronology: the study of tree rings where the size of ring depends on size of xylem vessels depending on [temperature, rain fall]

Correlation: a strong tendency for two sets of data to change together, proven by statistical analysis.

Causation: change in one variable directly result in a change of another variable, proven by test.

Temperature coefficient Q10: measure the effect of temperature on rate of reaction.

Aseptic technique: methods used to prevent contamination of person/culture with other micro-organisms.

Phagocytosis: when the pathogen is engulfed by the phagocyte. bacteria being inside a vacuole / phagosome.

Non-specific immune response: when body responds to a pathogen, when phagocytosis occurs.

Antibiotics: chemical substances produced by micro-organisms to kill or stop the growth of bacteria.

Bacteriostatic antibiotic: a chemical that prevents the growth of bacteria.

Bactericidal antibiotic: a chemical that destroys the bacteria.

Infection: presence of a pathogen inside cells.

vaccine: for active artificial immunity, it's the injection of weakened / attenuated or its antigen.

PCR: produce large number of copies of DNA [amplification]

Gel electrophoresis: for DNA profiling.

Succession: Decomposition stages and stages of insect life cycle.

Forensic entomology: the study of insect life relating it to crime.

Equations needed:

1- temperature coefficient Q_{10}:

$$Q_{10} = \frac{\text{Rate of reaction at } (x+10^{\circ}C)}{\text{Rate of reaction at } x^{\circ}C} \qquad \boxed{Q_{10} = \frac{R_{t+10}}{R_t}}$$

2- Percentage of efficiency of energy transfer:

$$\frac{\text{Energy available in one trophic level}}{\text{Energy available in previous trophic level}} \times 100$$

3- How to calculate the number of bacteria in a population:

$$N_t = N_o \times 2^{kt}$$

N_t = number of organisms at time t

N_o = number of organisms at time 0

$$k = \frac{\log_{10} N_t - \log_{10} N_o}{\log_{10} 2 \times t}$$

k = the exponential growth rate constant

t = the time the colony has been growing