

Synoptic Essay Titles

1. The functions of cell surface membranes
 - a. Control of substances entering and exiting the cell
 - i. Glucose absorption
 - ii. Osmosis
 - iii. Facilitated diffusion
 - iv. Nerve impulses
 - b. Chemical interface
 - i. Hormones – 2nd messenger
 - ii. Antibodies & Phagocytes
 - iii. Oestrogen & Transcription Factor
2. How the structure of cell organelles is related to their function
 - a. Nucleus
 - b. Mitochondrion
 - c. Chloroplast
 - d. Microvilli
 - e. Cell surface membrane
3. The process of diffusion and its importance in living organisms
 - a. Gas exchange in organisms
 - b. Digestion & Absorption
 - c. Nerve impulses
 - d. Synapses
 - e. Fick's Law
4. The difference ways in which organisms use ATP
 - a. Muscles
 - b. Glycolysis
 - c. Photosynthesis
 - d. 2nd Messenger Model
 - e. Hydrolysis
 - f. Active Transport
 - g. Codensation
5. How the structure of cells is related to their function

- a. Neurones
 - b. Muscle
 - c. Red blood cells
 - d. Palisade cells
 - e. Epithelial cells
 - f. Bacterial cells
 - g. Pacinian corpuscle
 - h. Optic receptors
6. The structure and function of carbohydrates
- a. Control of blood glucose levels
 - b. Polysaccharides
 - i. Starch
 - ii. Glycogen
 - iii. Cellulose
 - c. Respiration
 - d. Carbon Cycle
 - e. Digestion
7. How bacteria affect human lives
- a. Pathogens
 - i. Tuberculosis
 - ii. Cholera
 - iii. Antibiotic resistance
 - b. Gene technology
 - c. Decomposers
8. The biological importance of water
- a. Plants
 - i. Cohesion-tension & Transpiration
 - ii. Water uptake by roots
 - iii. Xerophytic adaptations
 - iv. Photosynthesis
 - b. Osmosis
 - i. Blood glucose levels
 - ii. Water potentials around plant and animal cells

- iii. Cystic fibrosis
- iv. Osmotic Lysis (antibiotics)
- v. Cholera
- c. Hydrolysis
 - i. Digestion
 - ii. $\text{ATP} \rightarrow \text{ADP} + \text{P}_i$
- d. Respiration

9. The way in which different species of organisms differ from each other

- a. Genetics
- b. Cellular
 - i. Plant cells vs Animal Cells
 - ii. Eukaryotic cells vs Prokaryotic cells
- c. Coordination
 - i. Nervous systems
 - ii. Hormonal systems/plant growth factors
- d. Gas exchange mechanisms

10. Describe how the structures of different polymers are related to their functions

- a. Polynucleotides
 - i. DNA
 - ii. tRNA
 - iii. mRNA
- b. Polysaccharides
 - i. Starch
 - ii. Glycogen
 - iii. Cellulose
- c. Phospholipids
- d. Proteins
 - i. Enzymes
 - ii. Protein channels
 - iii. Fibrous proteins

11. Why offspring produced by the same parents are different in appearance

- a. Recessive/dominant alleles
- b. Phenotype alters
- c. Meiosis
 - i. Crossing over
 - ii. Independent segregation
- d. Mutations
- e. Conjugation

12. The importance of hydrogen bonds in living organisms

- a. DNA
 - i. Replication
 - ii. Hybridisation
 - iii. Translation
- b. Proteins
 - i. Cellulose
 - ii. Tertiary and secondary structure
- c. Cohesion-tension theory

13. The movement of substances within living organisms

- a. Digestion
- b. DNA
- c. Nerve impulses
- d. Circulation
- e. Auxins

14. How the structure of proteins is related to their functions

- a. Protein channels
- b. Actin & Myosin
- c. Collagen
- d. Enzymes
- e. Hormones
- f. Antibodies

15. The process of osmosis and its importance to living organisms

- a. Osmotic lysis
- b. Cystic Fibrosis & Cholera
- c. Animal cells

d. Blood glucose

e. Root hair cells

16. Energy transfers which take place inside living organisms

a. Blood circulation

b. Respiration

c. Active transport

d. Digestion

e. Photosynthesis

17. The transfer of energy within and between organisms

a. Gas exchange

b. Carbon Cycle

c. Respiration

d. Photosynthesis

e. Digestion

f. Food chains and trophic levels

18. Inorganic ions include those of sodium, phosphorus and hydrogen. Describe how these and other inorganic ions are used in living organisms

a. Phosphate

i. Phospholipids

ii. Phosphorylation

iii. ATP

iv. Nucleotides

b. Iron

i. Haemoglobin

c. Hydrogen

i. Digestion

ii. Photosynthesis & Respiration

d. Sodium

i. Nerve impulses

ii. Co-transport

e. Calcium

i. Muscle contraction

ii. Synapses

19. The effect of temperature and the processes which occur in them

- a. Adaptations
- b. Ecto therms vs Endotherms
- c. Nerve impulses
- d. Enzyme action

20. The effect of ecological conditions on the distribution of organisms

- a. Ecological niches
- b. Temperature
 - i. Global warming
- c. Succession
- d. Adaptation
- e. Predation
- f. Speciation

21. Cycles in biology

- a. Carbon cycle
- b. Nitrogen cycle
- c. Polymerase chain reaction
- d. Heart cycle
- e. Oestrous cycle
- f. Cell cycle & mitosis
- g. Homeostatic cycles
 - i. Body temperature
 - ii. Heart rate
 - iii. Blood Glucose

22. The ways in which behavioural responses help to maintain organisms in favourable environments

- a. Reflex arcs
- b. Kineses
- c. Tropisms
- d. Taxes

23. Hormonal control

- a. Blood glucose control
 - i. Insulin

- ii. Adrenalin
 - iii. Glucagon
 - b. Oestrous cycle
 - c. Plant growth factors
- 24. How nitrogen-containing substances are made available to and are used by living organisms
 - a. Haber process
 - i. Fertilisers – eutrophication
 - b. Proteins
 - c. Nitrogen cycle
 - d. Organic bases
- 25. Carbon dioxide in organisms and ecosystems
 - a. Global warming
 - b. Respiration
 - c. Photosynthesis
 - d. Carbon cycle
 - e. Ventilation and circulation
- 26. Negative feedback and its importance in biology
 - a. Control of heart rate
 - b. Temperature control
 - c. Oestrous cycle
 - d. Blood glucose levels
 - e. Stabilising selection
- 27. Condensation and hydrolysis and their importance in biology
 - a. Digestion
 - b. Polymerisation
 - c. Hydrolysis of ATP
 - d. Glucose blood levels
 - e. Synaptic transmission