



Biology Past Paper Common Questions By Vasumitra Gajbhiye

Chapter 1

▼ Define species.

- (group of) organisms that can reproduce to produce fertile offspring.

▼ Define sensitivity.

- the ability to detect or sense stimuli in the internal or external environment ;
- and to make appropriate responses

▼ Define growth

- increase in, size/ length/mass / volume/AW ;
- increase in cell number ;

▼ Define organ.

structure made up of a group of tissues, working together to perform a specific function(s) ;

▼ Define the term sense organ.

- groups of receptor cells ;
- responding to specific stimuli ;

▼ How bacteria differ from other from other groups of organisms?

- cell wall, peptidoglycan/murein
- no nucleus/ no nuclear membrane/ have nucleoid

- loop of DNA
- no mitochondria
- no chloroplast
- no **vacuoles**
- smaller ribosomes
- have pili
- have capsule
- small

▼ **State features that all prokaryotes have.**

- cytoplasm;
- cell membrane;
- single celled / unicellular;
- no (true) nucleus / no nuclear membrane;
- loop of DNA / chromosome / naked DNA;
- no, (membrane-bound) organelles / mitochondria / chloroplasts;
- (peptidoglycan / murein) cell wall;
- AVP; e.g. plasmids

▼ **State structural features that distinguish the cells of a Protocista from a prokaryote.**

- nucleus / nuclear membrane / nuclear envelope ;
- (named) organelle(s) / internal membranes ;
- cell walls (if present) have different composition ;
- linear chromosomes ;

▼ **What are other names for protists?**

- protocists
- protocista

- protists
- protista

Chapter 2

▼ State the function of nucleus.

- stores / contains, chromosomes / genes / alleles / genetic information / DNA ;
- controls the (activity / reactions of the) cell ;
- controls how cells, develop / divide / reproduce / grow ;
- idea that it stores instructions for, making proteins / protein synthesis / making RNA ;
- codes for protein.

▼ State the function of cell membrane.

- forms a barrier between the cell and its surroundings ;
- keeps contents of cell inside ;
- allows / controls / (movement of) substances, into / out, of the cell / across membrane ;

▼ Define tissue.

- a group of cells with similar structures
- working together to perform a shared function ;

▼ Outline the roles of DNA in a cell

1. store of, genetic information / genetic make-up / genes / AW ;
2. DNA / genes / alleles / genetic information / base sequence, codes for / makes, (named) proteins ;
3. sequence of bases in DNA codes for sequence of, amino acids ;
4. transfer of information to daughter cells (during mitosis) ;
5. DNA copied as mRNA ;

Chapter 3

▼ Explain what happens to the cell of a leaf cause wilting.

- ref to osmosis
- water, lost from the cells
- down water potential gradient
- pressure of water on the cell wall decrease
- turgor pressure decrease
- plants/ cells rely on water for support/ to prevent wilting
- water in cells not being replaced as quickly (as it is being lost)

▼ Suggest the advantages to a plant of wilting.

- stomata closed
- to prevent water loss
- water conserved for other processes
- decrease surface area, exposed to the sun.

▼ What happens during plasmolysis?

- cytoplasm/ vacuole, decreases in, size/ volume ;
- (some) cell membrane/ cytoplasm, pulls away /AW, from cell wall ;
- plasmolysis / cells are plasmolyzed ;
- cells, are flaccid/ not turgid/ lose turgor ;
- cell walls no longer, pushed outward/withstand pressure ;

▼ Why plant cells don't burst?

Cell wall offers resistance.

▼ State features of diffusion that do not apply to active transport.

passive/ does not require energy ;
substances move down a concentration gradient ;
does not have to occur across a membrane ;

occurs with gases ;
no need for protein, carrier/ channels /pumps ;

Chapter 4

▼ What is the benefit of having less fat in diet?

- less cholesterol
- less risk of atherosclerosis/ blockage of arteries/ atheroma/ stroke/ CHD
- less risk of heart attack/ heart diseases
- less risk of obesity
- less calorie intake

▼ What is the benefit of having more fiber in diet?

- there is less risk of constipation (prevents)
- less risk of colon/ bowel cancer
- fiber absorbs and removes toxins.

▼ Describe the similarities between marasmus and kwashiorkor.

- both caused by protein (energy) deficiency ;
- both types of malnutrition / deficiency disease / caused by lack of a balanced diet ;
- primarily affects children ;
- diarrhoea ;
- low body mass / weight loss ;
- poor growth ;
- irritability / tiredness ;
- wastage of muscles ;
- dry skin / brittle nails ;
- brittle hair / change of hair colour ;

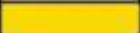
- fatty liver ;
- anaemia ;

▼ What is the colour of hydrogen carbonate in different pH?

GAS EXCHANGE EXPERIMENT

The indicator going to be used in this experiment is hydrogencarbonate indicator solution.

This will detect the concentration of carbon dioxide and respond with an appropriate colour change.

Concentration of CO ₂	Indicator Colour	Colour
Highest	Yellow	
Higher	Orange	
Atmospheric level	Red	
Low	Magenta	
Lowest	Purple	

Hydrogencarbonate indicator



Chapter 5

▼ Explain why the shape of an enzyme is important.

- correct ref to active site (substrate binds with the enzymes active site)
- enzyme must be complementary shape to, substrate
- to make enzyme - substrate complex/ to allow substrate to bind to enzyme
- ref to only fits one substrate/ specific to one substrate.

▼ Describe in detail how enzyme function.

1. enzymes are proteins;
2. enzymes can be reused / are unchanged in a reaction;

3. enzymes are specific;
4. (enzymes are) catalyst / speeds up reaction;
5. lowers (activation) energy needed for the reaction;
6. successful collisions;
7. active site;
8. (enzyme and substrate) fit together;
9. (enzyme and substrate) complementary shape / AW;
10. enzyme-substrate complex / ESC;
11. ref. to optimum, temperature / pH;
12. too much heat results in denatured enzymes;
13. too little kinetic energy / heat, less (successful) reactions;
14. incorrect pH results in denatured enzymes

▼ **Define the term catalyst.**

- (substance) that increases the rate of (chemical) reactions ;
- not changed, during / by, the reaction

Chapter 6

▼ **Describe the use of carbohydrates in plants.**

- cellulose ;
- for cell walls ;
- starch ;
- for energy/respiration ;
- to attract insects to flowers / nectar / fruits ;

▼ **Describe the use of amino acids in plants.**

- to make (named) proteins ;
- for enzymes ;

- for growth ;

▼ **Explain how gravitropism enables a plant to survive**

- (roots / plants growing down) anchor the plant / AW ;
- (roots / plants growing down are more likely) to reach, water / (named) minerals ;
- (shoots / plants) growing up are more likely to reach light ;
- (shoot or plant has better) access to (named) pollinators ;

▼ **Describe ways in which palisade mesophyll cells are adapted.**

- contain many chloroplasts / lots of chloroplasts ;
- are tightly packed ;
- are located near the top of the leaf ;
- arranged 'on end' / vertically / lengthways / columnar ;

▼ **Explain why some parts of a plant can act as both a source and a sink.**

source when it is (moving sucrose from) a region of production / photosynthesising ;

sink when it is, growing / storing / respiring / a region of utilisation ;

▼ **Explain how roots are adapted to absorb ions.**

root hair (cells) ;

through carrier molecules / AW ;

large/ increased, (surface) area (for absorption) ;

roots grow continually (to find new sources of ions) ;

AVP ; e.g. extensive root network / branching roots ;

▼ **Why increase in temperature increase rate of photosynthesis.**

temperature is a limiting factor ;

increases, (kinetic / heat) energy / the movement of molecules / diffusion ;

more collisions between substrate and enzymes ;

to speed up chemical reactions ;

stomata open wider ;
therefore increased carbon dioxide entering the leaf/AW ;

▼ **Why increasing temperature above optimum temperature decrease rate of photosynthesis.**

enzymes are denatured ;
enzymes are no longer active/AW ;
stomata close ;
therefore reduced carbon dioxide entering the leaf/AW

Chapter 7

▼ **Describe the role of bile.**

- emulsification
- increased surface area of fats globules
- for lipase
- speed up/ faster digestion of fats.
- to fatty acid and glycerol
- neutralises stomach acid
- alters/ increases, pH for pancreatic/ intestinal enzymes.
- denature pepsin

▼ **What are the symptoms of anaemia.**

- tired/ lethargic/ 'no energy'/ weakness
- shortness of breath
- chest pain
- fast heartbeat
- frequent infections
- headache/ dizziness/ light headedness
- cold, hands/ feet

- inflammation/ soreness of tongue
- brittle nails
- unusual craving for non-nutritive substances, such as ice, dirt or starch
- poor appetite
- tingling or crawling feeling in legs.

▼ **What is the cause of sickle cell anaemia?**

- Mutation
- change in base sequence
- in gene for haemoglobin.
- Different sequence of amino acids.
- Inherit the allele.
- Having the recessive allele
- produce, abnormal haemoglobin
- red blood cells have sickle shape

▼ **Explain how people with sickle-cell anaemia inherit the disease.**

- both parents carry the, recessive allele/ allele for (sickle cell) anaemia
- both parents are heterozygous
- half the gametes of both parents have the recessive allele
- people/ children, who are homozygous recessive have (sickle cell) anaemia.
- there is 25% chance of being homozygous....
-recessive / having (sickle cell) anaemia

▼ **The distribution of sickle-cell anaemia is the result of natural selection.**

Explain the distribution of the sickle-cell allele in human population.

- people with sickle cell anaemia/ heterozygous/ carriers/ are resistant to, malaria
- people with (homozygous) sickle cell anaemia are, less likely to survive/ die of sickle cell disease.

- people who are heterozygous are more likely to survive/ have selective advantage
- they are more likely to breed
- pass on allele for sickle cell
- so increase in frequency of sickle cell allele (in population)
- selective advantage for sickle cell only exists where, (mosquitoes carrying) malaria are present
- AVP; ref to evolution/ adaptation to (local) condition

▼ **Sickle-cell anaemia is a disease that reduces the delivery of oxygen to tissues. Explain why.**

- haemoglobin is, abnormal / rigid / AW ;
- abnormal haemoglobin carries less oxygen (than normal haemoglobin) ;
- red blood cells are, sickle shaped / AW ;
- (sickle cells) stick together / clot (in blood vessels) ;
- fewer red blood cells ;

▼ **Describe the effects of diarrhoea on the body.**

- watery faeces
- dehydration
- loss of, salts / ions / electrolytes
- cramps / stomach pain
- death

▼ **What is meant by double circulation.**

- one loop to lungs/ pulmonary circulation, and one loop to rest of the body/ systemic circulation
- blood flows through heart twice, for one (complete) circuit/ to get back to the same point.

▼ **What are the advantages of double circulation.**

- high(er), blood pressure / flow rate (than single circulation) ;
- allows different blood pressure in each loop ;
- prevent mixing of oxygenated and deoxygenated blood ;
- allows animals to have high metabolic rates ;
- allows animals to be, large / tall ;

OR

1. oxygenated and deoxygenated blood, are kept separate / do not mix / separated by septum ;
2. ensures efficient supply of oxygen (to, body / AW) ;
3. ensures efficient supply of (named) nutrients (to, body / AW) ;
4. low(er) pressure in, pulmonary, artery / circuit / AW ;
5. to prevents damage to (capillaries in the) lungs ;
6. allows more time for gas exchange ;
7. allows high(er) pressure (in body) ;
8. to ensure efficient, blood supply to (rest of) body ;
9. to allow filtration in kidneys (for excretion) ;
10. to allow / maintain, a high, metabolic rate / rate of respiration ;

▼ **What is the function of lymphatic system.**

- tissue fluid drains (into lymphatic vessels)
- transports tissue fluids
- back into the blood/ circulatory system
- contains, lymphocytes/ antibodies (in lymph nodes)
- defence against infection/ provide (active) immunity
- (lacteals) absorbs/ transports, fats/ fatty acids
- from small intestine/ duodenum/ ileum

▼ **Explain why vitamin D is important?**

- needed for (growth / development / strengthening of) bones ;
- needed for (growth / development / strengthening of) teeth ;
- prevents rickets ;

▼ **Explain why iron is important?**

- required to make haemoglobin / red blood cells ;
- for transport of oxygen ;
- prevents (iron-deficiency) anaemia ;

▼ **Explain why vitamin C is important?**

- helps with, cell / tissue, repair / healing ;
- helps to reduce risk of (named) infection / AW ;
- formation of, collagen / hair / nails
- anti-ageing of skin
- antioxidant
- prevent scurvy
- improves (named) mineral ion absorption
- required for protein synthesis

▼ **Describe the effects of vitamin D deficiency in humans.**

- muscle cramps;
- soft / bent, bones / rickets;
- stunted growth;
- prone to infections;
- fatigue;
- reduced ability to absorb calcium (ions);

▼ **What are the causes of Kwashiorkor ?**

- not enough protein (in the diet) ;
- **adequate** energy (in the diet) ;

- inadequate diet after breast feeding finishes / AW ;

▼ **Explain how cholera causes diarrhoea.**

- cholera / pathogen, releases/ produce toxin ;
- toxins attach to the wall of the small intestine ;
- toxin causes chloride secretion into small intestine ;
- lowering water potential in the intestinal lumen ;
- causing osmotic movement of water into the gut / water flows from, the cells / blood, into the, lumen / gut ;
- ref. to, osmosis / movement of water (into the lumen) ;
- (diarrhoea is) loss of watery faeces ;
- loss of salts / loss of minerals
- dehydration ;

▼ **Define chemical digestion.**

- breakdown of large molecules to small molecules ;
- from insoluble to soluble ;

▼ **Define the term assimilation.**

- movement of digested food molecules into cells ;
- food molecules become part of cells ;

▼ **Explain the role of mechanical digestion.**

- breaks up food into small(er) pieces ;
- without chemical change ;
- by teeth / muscles ;
- to mix (with digestive juice) ;
- increases surface area ;
- for enzyme action ;
- speeds up chemical digestion ;

- easier to swallow ;

▼ **What is the function of canine?**

piercing/ tearing the food

▼ **What is the function of molar?**

chewing/ grinding the food

▼ **Explain how villi are adapted for absorption.**

1. villi lining/ epithelium, only one cell thick/ thin
2. good blood supply / many capillaries ;
3. microvilli ;
4. large surface area ;
5. lacteal for fats / fatty acid, absorption ;
6. protein channels ;
7. mitochondria for active transport ;

▼ **Explain the importance/ function of microvilli.**

- idea of more (cell) membrane / large surface (area) ;
- allow, increased rate of / fast, absorption (of nutrients) ;

▼ **Suggest why a protective substance(mucus) is necessary in the intestines.**

- to protect the intestine from bacteria / viruses / microorganisms / parasites / pathogens ;
- to protect the intestine from (named) toxin(s) ;
- to protect the intestine from (named) enzymes / prevents self digestion ;
- to protect the intestine from (hydrochloric) acid / alkali / base / extreme pH;
- to protect the intestine from physical damage by food passing through intestine / AW ;

▼ **Describe the roles of lacteals.**

- absorbs, fats / fatty acids (and glycerol) ;

- transports, fats / fatty acids, into, lymph(atic) vessels / lymph(atic) system / lymph ;

Chapter 8

▼ Explain how transpiration occurs in leaves?

- water evaporates
- from the surface of mesophyll cells
- water vapour diffuses
- through the stomata out of the leaf

▼ Explain the mechanism that is responsible for the movement of water in xylem vessels.

- evaporation from (cell walls) in mesophyll ;
- diffusion of water vapour through stomata ;
- reduction of, pressure / water potential, at top (of plant) resulting in water moving upwards;
- continuous column of water (in the xylem) ;
- cohesion of water (molecules) ;
- cohesion described as, forces / attraction, between water molecules ;
- transpiration pull ;
- water enters or leaves xylem, by osmosis / down water potential gradient ;

▼ Explain the role of phloem in plant transport.

- translocation
- (phloem) allows bidirectional movement
- movement of food from source to sink
- sucrose/ amino acids/ food are produced at a source
- region of respiration/ growth/ storage is a sink

- named example of a source/ sink (when photosynthesising leaves are source and roots are sink)
- some organs can be both a source or a sink at different times.

▼ **Explain how xylem is adapted for its function.**

Functions

- conduct / transport, water (and mineral ions)
- ref to transpiration ;
- reduced resistance to water flow / AW ;
- (structural) support (for plant) ;
- prevents (inward) collapse (of xylem vessels)
- (spirals) allows (some) flexibility / bending, of stems (to prevent breaking)

Adaptations

- long / elongated (cells / vessels / tubes) ;
- ref to lignin (in walls) ;
- (cell walls) are water impermeable / waterproof / AW to prevent water loss ;
- (secondary) thickening of cell walls ;
- hollow / no cytoplasm / no (named) organelles ;
- no, end / cross, walls (between cells) ;
- end plates to connect vessels (end to end) ;
- pits in walls (for water movement between vessels) ;

▼ **State structural features of xylem vessels and explain how this is related to the function of water transport.**

thick / strong, (cell) wall ;

withstanding, tension / collapse / hydrostatic pressure / AW ;

lignin (in walls) / walls are impermeable ;

prevents collapse / waterproofing ;

wide / AW ;

transport large volumes of water ;

no (cell) contents / empty / dead cells / like pipes / like tubes ;

no / little resistance to flow of water / allows water to flow easily / lots of water / continuous columns of water / no obstruction ;

no, cross walls / end walls ;

no / little, resistance to flow of water / allows water to flow easily / lots of water / continuous columns of water / no obstruction ;

(bordered) pits ;

lateral transport / AW ;

▼ **What is the feature and adaptation of epidermis?**

- transparent/ clear/ no chloroplast ⇒ allows light to pass through.
- thin/ flat ⇒ so less cytoplasm/ more light, to pass through
- guard cells/ stomata ⇒ allow gases to enter/ leave the leaf/ gas exchange

▼ **What is the feature and adaptation of mesophyll?**

- contains many chloroplasts (palisade) ⇒ trapping light energy
- vertically/ tightly, packed/ column-shaped (palisade) ⇒ maximise light received (by cells)/ reduce number of, cross/ cell, walls
- contain (air) spaces/ loosely packed (spongy) ⇒ for diffusion/ movement of gases (within leaf)

▼ **Explain the effects of nitrate ion deficiency on plant growth.**

- plants absorb (nitrogen as) nitrate (ions) ;
- needed to make, amino acids / (named) proteins ;
- to make DNA / RNA / nucleotides / bases ;
- protein / DNA, is needed for, growth / cell division / mitosis ;

▼ **Explain how 2,4-D acts as a weedkiller.**

- 1 absorbed by (broad leaved) weeds / selective for weeds ;
- 2 less absorption by (narrow leaved) crops ;
- 3 increase the growth (rate) of weeds ;

- 4 plant cannot produce enough, glucose / photosynthesise fast enough ;
- 5 weeds cannot maintain rate of growth ;
- 6 AVP ; e.g. falls over and can't absorb sunlight

▼ **Explain how auxins control the growth response.**

- (auxins is a hormone) made / produced, in (shoot), tip / apex ;
- pass / move / diffuse / spread (down the stem) ;
- auxins collect in the side, in the dark / away from light ;
- stimulates **greater** cell elongation on side in the dark ;
- AVP e.g. absorption of water (by osmosis) / stretching of cell walls / phototropic(s) / plants detect or sense light / ref to turgor pressure

▼ **Describe and explain how root hair cells are adapted for their function.**

- long and thin;
- thin cell wall;
- large surface area;
- for absorption;
- (water by) osmosis ;
- (ion / nutrients by) active transport;
- against the concentration gradient;
- protein (pumps) in membrane;
- require energy / ATP;
- ref. to many mitochondria;

▼ **What is the function of stomata?**

- for gas exchange / diffusion of gases ;
- for, photosynthesis / respiration / transpiration ;;
- correct gas with direction for named process ;;
- controls the rate of, diffusion / transpiration / photosynthesis ;

- ref. to transpiration pull ;

▼ **Outline how water that has entered a root hair cell reaches the stomata.**

- 1 water moves from root cells, into xylem ;
 - 2 cohesion / adhesion AW, of water molecules ;
 - 3 (this) pulls on/ creates tension (in water column in xylem) ;
 - 4 Water moves up/ through, the xylem ;
 - 5 mass flow of water (in xylem)/ transpiration stream ;
 - 6 water moves into leaf by osmosis (from xylem) ;
 - 7 loss of water from leaf (cells) lowers water potential ;
- A ref to water potential gradient
- 8 evaporation, from surfaces of (mesophyll) cells / into air spaces (in leaf) ;

Chapter 9

▼ **How CHD is caused?**

- fat is deposited in the walls of coronary arteries
- arteries are blocked/ blood flow is restricted in arteries
- less/ no, blood flow to, heart muscles/ cardiac muscles/ wall of heart
- less/ no, nutrients/ glucose/ oxygen, reaches heart, muscle/ walls/ cells.

▼ **How CHD is treated?**

- Drugs treatment to lower blood pressure.
- or prescribe aspirin to reduce risk of blood clotting.
- coronary by pass operation can be done
- a piece of blood vessel attached/ joined to carry blood around the blocked artery
- angioplasty can be done
- balloon inserted into artery and inflated using water to widen artery.
- stents. small mesh can also be inserted (into artery) to hold the artery open

- to restore blood supply

▼ **How CHD is prevented?**

- reduced, salt / (saturated) fats / cholesterol ;
- stop smoking ;
- reduce stress ;
- AVP ; e.g. / medication qualified / control diabetes / reduced alcohol / reduce blood pressure

▼ **Explain why exercise is recommended for people with a high risk of developing coronary heart disease.**

- prevents blocked arteries / prevents thrombus formation ;
- lowers blood pressure ;
- lowers cholesterol / lowers fats / reduces risk of atheroma ;
- weight loss / using fats / avoids obesity ;
- lowers stress ;
- (heart) muscle stronger / lower (resting) pulse ;

▼ **Describe the effect on the heart of a blockage in the coronary artery.**

- lack of oxygen supply
- less of aerobic respiration
- heart cells die
- muscles cannot contract

▼ **Describe the functions of arterioles in the skin.**

1. deliver / supplies, blood / oxygen / glucose (from arteries) to, capillaries / shunt vessels ;
2. controls blood flow, through capillaries / to the surface of the skin ;
3. by vasoconstriction / vasodilation ;
4. ref to (arteriole) muscle contraction / relaxation ;

5. ref to maintenance of body temperature / homeostasis / description of ;

▼ **Describe the structure of veins.**

- (semi-lunar) valves ;
- large, lumen / AW ;
- thin(ner) walls (than arteries) ;
- (thin) elastic, tissue / layer / wall ;
- (thin) muscle, tissue / layer / wall

▼ **Describe and explain the structure of arteries.**

- thick wall ;
- withstands / AW, (blood) pressure ;
- muscular (tissue) ;
- (vaso)constriction / (vaso)dilation / resisting rupture / withstands pressure ;
- elastic (tissue) ;
- stretches to allow blood surge / AW or recoils to maintain (blood)
- small lumen ;
- maintains (blood) pressure ;
- fibrous (tissue) ;
- maintains shape / prevents bursting ;
- pressure / smooths out blood flow ;
- folded / crinkly, endothelium / lining ;
- allows artery to stretch / allow larger volume of blood to flow / AW ;

Chapter 10

▼ **Outline the role of antibodies in the defence of the body against pathogens.**

- antibodies lock on to antigens.
- antigens are present on the pathogens cell membrane

- antibodies are specific to pathogens
- antibodies have shape complementary to antigen
- antibodies destroy pathogens
- antibodies, mark pathogens for destruction by phagocytes.

▼ **State the role of lymphocytes.**

- (lymphocytes) provide (active) immunity ;
- produce antibodies ;
- antibodies are specific to antigen
- (antibodies) lock-on to antigens ;
- (antibodies mark) pathogen / antigen, for destruction / AW ;
- (lymphocytes) produce memory cells ;

▼ **Define the term transmissible disease.**

- Disease caused by pathogen
- that can be passed from one host to another.

▼ **How vaccination provides active immunity?**

- vaccine are injected. vaccine contains harmless pathogens
- this stimulates immune response
- ref to lymphocytes (lymphocytes identify the antigen on the pathogen)
- lymphocytes produce antibodies
- ref to specificity (antibodies are specific to pathogens)
- production of memory cells
- rapid immune response if exposed to the same pathogen
- provide long term immunity.

▼ **Why antibodies must be injected rather than taking them by mouth?**

- antibodies are made of protein
- proteins are digested in the alimentary canal

- direct route to site of infection

▼ **Why passive immunity does not give long-term protection against diseases?**

- no immune response
- no memory cells
- antibodies are broken in the body
- antibodies are not made by body's own lymphocytes.

▼ **How bacterial resistance is caused**

- **Mutation** cause change in DNA base sequence
- Some bacteria develop resistance
- Bacteria with resistance survive and bacteria without resistance die as a result of **natural selection**
- Surviving bacteria **multiply**/reproduce
- And **pass on their alleles** for resistance **to their offspring**

▼ **Explain why it is important that the equipment used for taking blood is clean (sterile).**

- prevents contamination / transmission, of (named) pathogen / toxin ;
- prevents, infection / spreading of disease / illness ;

▼ **What is passive immunity?**

1. short-term defence against pathogens ;
2. no immune response / immediate protection / no memory cells produced / no antibodies produced by the body ;
3. from antibodies, acquired from elsewhere / AW ;
4. e.g. across placenta / breast-feeding / breast milk / colostrum / antitoxin / antivenom / tetanus injection / immunoglobulins ;

▼ **Why antibiotics cannot kill viruses?**

- idea that viruses have no antibiotic targets ;
- viruses, are not alive / are not living / cannot be killed / not cells ;

- no cell membrane ;
- no cell wall ;
- no protein synthesis / no ribosomes ;
- no metabolism / do not respire ;
- AVP ; e.g. viruses are inside (host) cells

▼ **Describe how HIV is transmitted from one person to another.**

- (exchange of) contaminated / infected (named) / AW, body fluids ;
- using (contaminated) needles (ignore ref to drugs unqualified)
- sexual contact (with infected people)
- (contaminated) blood transfusion
- (tissue / organ) transplants
- blood to blood contact
- child birth
- breast-feeding (if mother is infected)

▼ **Outline the consequences of HIV.**

- fewer antibodies (produced by lymphocytes) ;
- decrease in immunity / inefficient immune system ;
- fewer memory cells ;
- any role of antibodies or lymphocytes (that will be impacted by fewer lymphocytes);
- develop AIDS ;
- example of (secondary) infection / disease / pathogen that may result from reduced number of lymphocytes

Chapter 11

▼ **What are the features of gas exchange surfaces?**

- large surface area (for diffusion)
- thin
- short diffusion distance
- good blood supply
- good ventilation
- permeable
- moist

▼ **What is the function of cartilage?**

- keep the airway/ trachea open
- prevent collapse
- protects (named) airways ;
- allows (free flow of) air into (the lungs) ;
- allows flexibility / can breathe even when, bent / swallowing / AW ;
- reduces resistance to movement of air ;
- sound production in larynx ;
- forms incomplete rings around, trachea / bronchi ;
- AVP ;

▼ **Why alveoli have thin walls?**

- for, gas exchange / diffusion / movement of CO₂ and O₂ ;
- short distance (for diffusion / gas exchange) ;
- fast (gas exchange / diffusion) ;

▼ **How could you measure pulse rate?**

- fingers on, wrist / neck / artery ;
- number beats over a period of time / bpm ;
- use a heart rate monitor / AW ;
- contact of sensor with skin ;

▼ **What is the effect of carbon monoxide on gas exchange system?**

- binds to haemoglobin (permanently)
- reduce oxygen (transport capacity)

▼ **What is the effect of tar on gas exchange system?**

- carcinogenic / causes lung cancer;
- sticks to / blocks / damages, alveoli / cilia;
- produce more mucus;
- making prone to (named) respiratory infections;
- reduced, diffusion / gas exchange;

▼ **What is the effect of smoke particles on gas exchange system?**

- trigger white blood cells ;
- irritant/ causes asthma/ prone to infection ;
- phagocytosis described ;

▼ **Explain why it is recommended that pregnant women do not smoke.**

- toxins / AW, in smoke can cross the placenta;
- increased risk, of miscarriage / still birth / premature birth / low birth weight / deformities;
- reduces oxygen available to the foetus / foetal brain damage;
- increased risk, of reduced lung, function / infection, in foetus / infants;
- babies more likely to become addicted / have withdrawal symptoms;

▼ **What is the function of goblet cells and ciliated cells?**

goblet cells, release/produce, mucus ;
mucus traps, dirt/ particles / pathogens ;
cilia, beat/AW ;
to move, fluid/AW, up/ out (of airway) ;

▼ **Describe the mechanism of inspiration.**

external intercostal muscles contract ;
internal intercostal muscles relax ;

lifts ribs, upwards / outwards ;
diaphragm contracts ;
diaphragm, flattens / drops ;
volume of, thorax / lungs / chest, increases ;
pressure in, thorax / lungs / chest, decreases ;
air flows in down a pressure gradient ;

▼ **Describe the mechanism of expiration.**

external intercostal muscles relax;
internal intercostal muscles contract;
lifts ribs, downwards / inwards ;
diaphragm relax;
volume of, thorax / lungs / chest, decrease ;
pressure in, thorax / lungs / chest, increase;
air flows out down a pressure gradient ;

Chapter 12

▼ **Describe how impulses are transmitted across the synapse.**

- vesicles containing neurotransmitters move to the cell membrane.
- vesicles fuse with the cell membrane.
- releasing neurotransmitters (into the synaptic cleft).
- neurotransmitter diffuse across the synaptic cleft
- neurotransmitter binds with the receptor.
- neurotransmitter and receptors are complementary
- results in an impulse in next neurone.

▼ **What are nerve impulses?**

- electric signals
- that pass along neurons
- in one direction

▼ **Define hormone.**

- chemical/ substance, produced by a gland
- transported in the blood (plasma)
- alters the activity of one or more specific target, organs/ tissues/ cells.

▼ Explain the advantages of coordinating the response to a dangerous situation using both the nervous system and the endocrine system.

- nervous system, responds quickly / immediately ;
- idea that (nerve) impulses travel to, (specific) muscles / (adrenal) glands / effector(s)
- effects of endocrine system are long lasting;
- hormones / adrenaline, travels throughout the body / allows multiple (target) organs to respond (to same signal) ;
- idea that less energy required than to have nerves going to every, cell / tissue ;
- stimulate both voluntary and involuntary responses (simultaneously) ;
- more effective / enhanced, response (than using one system alone) ;

▼ Describe the role of insulin in the body.

1. insulin is a hormone ;
2. controls blood, glucose / sugar, concentration / level
3. stimulates liver (cells and muscle cells) ;
4. to, absorb / take up, glucose / sugar, from the blood
5. across cell membranes ;
6. stimulates production of glycogen (in cells) / AW ; (convert glucose to glycogen)
7. reduces concentration of, glucose / sugar, in the blood ;
8. homeostasis ;

▼ Explain how co-ordination by hormones differs from co-ordination by nerves.

- hormones are chemicals / hormonal coordination is only chemical ;
- transported in the, blood / circulatory system ;

- (effects are) slower (than nerves) ;
- (effects are) longer lasting ;
- each hormone may have more than one target, organ / tissue / cells ;

▼ **Describe the function and adaptation of neurones.**

- **long**, to transmit (impulse), over (long) distance / faster / direct connection ;
- **mitochondria** to (release energy), for transmission of impulse / protein synthesis / active transport / making (neuro)transmitters
- **vesicles** to, carry / hold / release, chemicals / (neuro)transmitters (into synapse)
- (neuro)**transmitters** are released, to allow connection to other neurones / across a synapse ;
- **receptors** / vesicles, allow unidirectional transmission ;

▼ **State ways in which a voluntary action differs from an involuntary action**

- slower / takes more time ;
- needs thought / uses (higher centres of) the brain / conscious control
- learnt / not inherited / not innate / needs training / AW ;
- not automatic ;
- response is not always the same to the stimulus ;

▼ **Describe the role of rod cells.**

- sensitive to / detect, light ;
- in low intensity / night ;
- pass impulse to, sensory neurone / optic nerve ;

▼ **Describe the symptoms of type 1 diabetes.**

- fatigue / AW ;
- thirst / AW ;
- increased urination / glucose in urine / fruity

- breath / ketosis / flushed face;
- weight loss / nausea / vomiting / abdominal pain / hunger ;
- blurred vision / glaucoma ;
- behavioural changes / confusion / faint / unconscious / coma(tose) / dizzy / rapid breathing / deep breathing ;
- slow (wound) healing / poor circulation ;

▼ **Describe the treatment of type 1 diabetes.**

- insulin ;
- by injection / insulin pump ;
- regular blood glucose tests ;
- regular meals and controlled diet ;

▼ **Outline the short-term effects of heroine.**

- depressant ;
- increases reaction times / slows down impulses / slows down the nervous system ;
- ref. to effect on synapse / AW ;
- loss of self-control / mental function is affected / inability to walk or talk ;

▼ **State withdrawal symptoms that heroin users may experience.**

- sleeplessness / insomnia /
- restlessness ;
- fatigue / yawning ;
- diarrhoea ;
- hallucinations ;
- anxiety / depression / mood swings / aggression / irritation / confusion ;
- muscle cramps / aches / pain ;
- nausea / vomiting ;

- headaches / dizziness ;
- shivering / chills / fever ;
- itching ;
- runny nose / sweating / clammy skin /
- crying ;
- dehydration / (extreme) thirst ;
- rapid heart rate / hypotension ;
- AVP ; cravings / double vision

▼ **State two immediate effects of excessive alcohol on the body.**

- depressant ;
- lengthens reaction time(s) ;
- reduces self-control ;
- any appropriate effect on the nervous system described

▼ **Outline the harm to fetus of mother drinking alcohol.**

- miscarriage ;
- premature birth ;
- low birth weight ;
- addiction / dependence ;
- fetal alcohol syndrome (FAS) ;

▼ **Describe and explain the changes that occur in the eye when adjusting focus from a distant object to a near object**

- ciliary muscles contract ;
- tension in suspensory ligaments decreases ;
- lens becomes more convex ;
- causing more refraction ;

▼ **Explain how heroin affects the function of the synapse.**

- heroin is converted to morphine
- heroin diffuse across the synaptic cleft.
- heroin bind with the receptor.
- heroin is complementary to the receptor.
- blocks neurotransmitters entering the receptor site.
- stimulates receptor
- decrease/ increase pain perception

Chapter 13

▼ Outline the role of liver in excretion.

- Deamination of amino acids
- removal of nitrogen-containing part of amino acids
- to produce urea
- urea passes into blood
- breakdown of, hormones, toxins, drugs, excess vitamins.
- break down of, worn out red blood cells
- excretory products put in bile ; e.g. cholesterol

▼ Define excretion.

removal from the, body / organism/ cell ;
 (of) poisons / toxins / harmful substances ;
 named example (or) waste products of,
 metabolism/respiration/ deamination/ chemical reactions in cells ;
 substances in excess (of requirements) / AW ;

▼ Where is blood filtered in kidney?

Cortex

▼ Outline the role of the glomerulus.

- provides blood at high pressure ;

- provides a large surface area ;
- (ultra)filtration ;
- ref. to small or soluble molecules / water / glucose / urea / salts, (are filtered/ forced) out ;
- ref. to (named) large OR insoluble (molecules) / blood cells, stay in the glomerulus ;
- proteins are too big to move out of glomerulus
- filtrate consists of water, dissolved salts, glucose and urea

▼ **Describe the function of glomerulus in the kidney.**

- Ultrafiltration
- high blood pressure assists filtrate to pass through glomerulus
- proteins are too big to move out of glomerulus
- filtrate small enough can move through
- filtrate consists of water, dissolved salts, glucose and urea

▼ **What is the function of bowman capsule?**

Collect the filtrate/ allows filtration

▼ **What is the function of tubule?**

Selective reabsorption. reabsorbs water, salts and glucose back into the blood.

▼ **What is the function of collecting duct?**

reabsorbs water and passes urine to pelvis/ ureter

▼ **Explain how a dialysis machine filters blood.**

- dialysis membrane is partially permeable
- salts and urea move by diffusion
- down a concentration gradient
- water, moves by osmosis
- excess salts leave the blood and enter the dialysis fluid.

- excess water leave the blood and enter the dialysis fluid.
- from high water potential to low water potential across membrane.
- proteins are too large to move across membrane
- glucose is not removed by dialysis, because it is in same concentration
- fresh dialysis fluid maintains a concentration gradient

▼ **State which waste substances are removed from the blood during dialysis?**

- urea
- ammonia
- uric acid
- creatinine
- (named) salts/ ions; e.g. Na^+ , Cl^- , Mg^{2+} , Ca^{2+} , HCO_3^-
- Water
- (named) toxins
- hormones

▼ **Before a kidney is transplanted, it is important to match the tissues type of the donor with the tissues type of the recipient. State why this is necessary.**

- avoid rejection
- stop immune system attacking new kidney

▼ **What are the disadvantages of kidney transplant?**

- need, immunosuppressant drugs
- risk of death/ infection, during/ after, the operation
- rejection of kidney
- finding a compatible donor
- water retention

▼ **What are the advantages of kidney transplant?**

- patients do not need to return to clinic for dialysis/ no need for regular visits to hospital
- can eat normally/ do not need to eat a restricted diet
- fewer fluid intake restrictions
- periods of feeling unwell reduced/ absent
- less unwell/ tired/ nausea/ headaches/ less pain (after surgery)/ no needles/ no fistula, in permanently in arm
- idea of improved quality of life / AW ;
- cost effective in the long term ;
- ref. to having a working kidney / long-lasting / ref. to cure / one-time treatment ;

▼ **Define the term deamination.**

- removal of nitrogen containing part of amino acids ;
- to form urea

▼ **What are the long term effects of alcohol consumption?**

- cirrhosis (of liver)/(chronic) liver disease/ kidney failure/ liver failure ;
- cancer of the liver ;
- brain damage ;
- stomach ulcers ;
- heart disease/ high blood pressure ;
- oral cancer/ mouth cancer/ throat cancer/AW ;
- pancreatitis ;
- reduced fertility ;
- depression/AW ;
- addiction/dependence ;
- heart failure/stroke/heart attack

▼ **What is the advantage to red blood cells of not having a nucleus?**

- more space for haemoglobin ;
- to enable greater oxygen carrying capacity /AW ;
- more flexible shape (to move through capillaries) ;

▼ **Describe the process of blood clotting.**

ref to platelets ;

fibrinogen converted to fibrin ;

soluble to insoluble/ fibrin is insoluble ;

thrombin/ enzyme in context ;

mesh/ network /web, to trap blood (cells) ;

AVP ; e.g. reference to prothrombin or involvement of calcium ions

Chapter 14

▼ **State which events occur between pollination and fertilisation.**

- pollen lands on stigma
- pollen (grain) germinates/ pollen (grain) grows pollen tube
- pollen tube grows down the style
- reaches the ovule
- (tip of) pollen tube breaks open
- male gamete travels down the pollen tube
- male gamete enter ovule
- (male gamete) fuse with female gamete
- zygote forms.

▼ **State which events occur between fertilisation and production of seed.**

- zygote (is formed)
- divides by mitosis
- to form embryo
- formation of radicle and plumule

- formation of, cotyledons/ seed leaf/ food reserve
- formation of testis/ seed coat
- ref to endosperm
- seed formed from ovule

▼ **What is the advantage of sexual reproduction in wild population of flowering plants.**

- (gives) genetic variation / diversity ;
- allows mutations to be, expressed / AW ;
- allows adaptation to, new conditions / changed environment / AW ;
- (new species) can evolve / allows natural selection to occur ;
- ref to, alleles / genes / DNA, from different, plants / parents ;
- pollen exchanged between individuals / cross pollination ;
- seeds are dispersed ;
- can colonise new areas / AW ;
- less competition (with parent plant / among offspring) ;
- seeds may be dormant ;
- survival through, harsh / adverse, conditions ;

▼ **What are the advantages of self-pollination.**

- greater chance of fertilisation;
- not dependent on (named) agent of pollination ;
- useful if plants are (geographically) isolated / on their own / AW ;
- less wastage of pollen ;
- only one plant needed / no mate required ;
- greater chance of pollination / ensures pollination occurs ;
- parent plants adapted to the environment, pass alleles to offspring / AW ;
- adapted variety spreads ;

- idea that reproduction / fertilisation, successful if no other plants (of same species) nearby ;

▼ **What are the advantages of cross-pollination.**

- allows, variation / genetic diversity ;
- plant more likely to survive (named) environmental change ;
- resistance to disease ;
- (ability to) evolve ;
- ref. to fitness ;

▼ **What are the disadvantages of self-pollination.**

- little / less / AW / no, variation / (genetic) diversity ;
- increase chance of genetic disease ;
- risk of extinction ;
- ref to becoming homozygous ;
- less chance of, surviving / adapting / evolving, to, changing conditions / new environments / (new) disease ;

▼ **What are the implications of self-pollination?**

- less variation/ reduced gene pool/ uniform crop
- less chance, for evolution to occur/ adaptation to new environment
- more chance to pass on genetic diseases
- well adapted to environment
- no external agent of pollination required/ more change of fertilisation
- single plant can reproduce
- whole crop would be susceptible to adverse factors e.g. drought/ disease

▼ **State how self-pollination differs from cross-pollination**

- self-pollination is within the same, plant/flower ;
- cross-pollination is between different plants ;

▼ **State structural features of wind pollinated plants.**

- long filaments ;
- anthers / stamens, hang outside/anthers / stamens, easily exposed to the wind ;
- stigma/ style, hangs outside ;
- large/ feathery / hairy, stigma ;
- small/ light, pollen ;
- no/reduced, petals ;
- anthers loosely attached to the filaments ;

▼ **State structural features of insect pollinated plants.**

- large and brightly coloured petals
- large sticky and spiky pollen grains
- anther inside the flower
- stigma inside flower
- nectar is present
- scent is present
- moderate number of pollen grains

▼ **Name the part of the flower that develops into the seed.**

Ovule

▼ **Name the part of the flower that develops into the fruit.**

Ovary

▼ **State an advantage of seed dispersal.**

colonise new areas ;
reduce (intraspecific) competition ;
reduce inbreeding

Chapter 15

▼ **What is the importance/advantage of sexual reproduction?**

Below 4 points are importance

- maintain/ increase, population
- allow variation
- allow adaptation to, new/ changed environment(s)
- allow natural selection/ evolution/ formation of new species.

Below 4 + Above 4 are advantages. (Below 4 are not importance)

- variation caused by meiosis
- for example through crossing over/ independent assortment
- random fusion of gametes
- ability to express recessive traits.
- allows to use selective breeding

▼ **What are the disadvantage of sexual reproduction?**

- Slow
- Lots of energy is needed
- Need 2 parents

▼ **What are the advantages and disadvantages of asexual reproduction?**

Advantage

- Quick
- One parent is needed
- Does not need much energy
- No gametes
- Favourable characteristics of parent passed on
- Dense colonies outcompete other species
- no pollinators required

- reliable
- no harmful variation

Disadvantage

- no / little, (genetic) variation ;
- Limited ability to adapt to change in environment/ cannot adapt to changed environment
- competition for resources as all individuals are close together ;
- Lack of diversity
- Risk of overpopulation
- Offspring genetically identical to parents - no genetic diversity - so may inherit diseases
- increased risk of inheriting harmful, alleles / features / trait ;
- no new adaptive features ;
- no evolution / no (natural) selection / no artificial selection / AW ;
- no / little, ability to respond to (named) environmental change ;
- all individuals are susceptible to the same, diseases / pests ;
- higher risk of extinction ;

▼ What is the importance of meiosis?

for adaption to, new/ changed environment ;
 causes (genetic) variation ;
 competition for survival ;
 best suited reproduce ;
 allows natural selection ;
 allows evolution ;

▼ What is the role of placenta in humans?

- gas exchange
- transfer of dissolved nutrients, from maternal (circulation)/ to fetal.

- transfer of excretory products, from fetal/ to maternal;
- by diffusion
- produces/ secretes, (named) hormones;
- passive immunity/ antibodies, from maternal/ to fetal
- prevents/ limits, mixing of blood
- regulating blood pressure
- maternal/ fetal **attachment** point
- red to counter current flow/ maintains concentration gradient

▼ **What is the role of amniotic fluid?**

- protection from (mechanical) shock (of fetus)
- maintains (constant) temperature (of fetus)
- allows movement (of fetus)
- prevents dehydration

▼ **Describe the functions of amniotic fluid and the amniotic sac.**

- maintains temperature ;
- mechanical shock protection ;
- allows movement (of the fetus) ;
- provides support (of the fetus) ;
- provides a sterile environment / prevents infections ;
- (movement) allows for development of bones and muscles ;
- ref. to swallowing (of fluid) ;
- lubrication / AW ;

▼ **How sperm cell is adapted for its function?**

- flagellum/ 'tail', for swimming/ movement
- small/ streamlined shape, for (efficient) swimming
- mitochondria, for providing energy

- acrosome/ (packet of) enzymes, for digestion of (follicle) cells

▼ **How does fungus reproduce asexually?**

- mitosis
- no fertilisation
- budding off (of spores)/ fragmentation
- vertical hyphae
- production of spores
- sporangium bursts/ open/ releases
- ref to number of nuclei per spore
- method of spore dispersal i.e. air/water/wind
- DNA replication

▼ **Define asexual reproduction.**

- production of genetically identical offspring ;
- from one parent ;
- no gametes /(only) mitosis

▼ **What are the advantage of breast feeding?**

- bonding with mother
- it's free
- no risk of infection
- is at correct/body temperature
- no preparation/ easily available
- provides, best/ complete/ most suitable, food
- easier to digest
- contains antibodies/ provides passive immunity
- provides protection against, pathogens/ diseases/ microorganisms
- reduce risk of allergies

- contraceptive effect

▼ **What are the disadvantages of breast feeding?**

- not all mothers can produce enough milk ;
- some drugs can pass through into milk ;
- transfer of named pathogens in correct context ;
- painful nipples ;
- time consuming ;
- only mother can produce milk / fathers can't express milk ;
- infant not, suckling / has difficulties, so not enough intake / AW ;
- tiring ;

▼ **Describe the role of ribosomes in the synthesis of proteins such as enzymes.**

- mRNA passes through ribosomes
- ribosomes assemble amino acids into proteins
- order of amino acids is determined by the sequence of bases in mRNA

▼ **Describe how protein are made in cell.**

- ribosomes make protein
- mRNA is copied, from the DNA
- DNA remains in nucleus
- mRNA moves from the nucleus to the cytoplasm
- mRNA passes through ribosome
- ribosome assembles/ joins amino acids into protein
- protein synthesis uses energy
- order of amino acids determined by base sequence of mRNA/ DNA.

▼ **Discuss the advantages of growing crops in glasshouses.**

- 1 glasshouses can maintain, optimum / AW, conditions for photosynthesis ;
- 2 ref. to limiting factors for, photosynthesis / growth ;

3 to increase yield / continuous production / production independent of seasons ;

ref. to control of light

4 (can, achieve / maintain) optimum, light / light intensity / wavelength ;

5 light duration / use artificial lights (and timers / light sensors) ;

ref. to control of temperature

6 (can, achieve / maintain) optimum temperature ;

7 heater / cooling / idea of ventilation ;

ref. to control of carbon dioxide

8 (can use) carbon dioxide enrichment / high carbon dioxide concentration ;

9 burn (named) fuels / pump in carbon dioxide ;

ref. to control of water and nutrients

10 water supply / humidity ;

11 nutrients / minerals ;

12 irrigation / fertigation / misting / hydroponics / described ;

ref. to control of pests and weeds

13 pest control ;

14 any type described ; e.g. biological control / chemical control

15 herbicides not required ;

Additional points

16 computer control / automation (described) ;

17 efficient use of land / use brownfield sites / local food near markets ;

18 reduction in pollution by, fertilisers / pesticides ;

19 control of pollinators for selective breeding ;

▼ **Define meiosis.**

1. reduction / nuclear, division ;
2. chromosome number is halved ;
3. (diploid to) haploid ;
4. results in genetically different, cells / gametes / AW ;

▼ **Outline the processes of labour and birth.**

- breaking of the amniotic sac ;

- amniotic fluid is released ;
- contraction of (the muscles in the) uterus (wall) ;
- dilation of the cervix ;
- passage through the vagina ;
- (tying and) cutting the umbilical cord ;
- delivery of the afterbirth / placenta ;

▼ **Explain why the sex of a child is determined by its father.**

- idea that sex is determined by X and Y chromosomes / males are XY and females are XX ;
- egg cells have X chromosome / females can only provide X chromosome ;
- sperm cells have X or Y chromosome / only the males can provide X or Y chromosome / only males can provide the Y chromosome ;

▼ **Outline the process of artificial insemination.**

1. collect semen / sperm (implied by context) ;
2. freeze semen / sperm, / use sperm bank / use sperm collected, far away/ long ago ;
3. selecting / washing / screening, of sperm / AW ;
4. use fertility drugs containing hormones for (super)ovulation ;
5. determine when female is about to ovulate ;
6. insert, semen / sperm, into female (vagina / uterus) ;

▼ **Outline the process of in vitro fertilisation (IVF).**

- collect / extract, eggs ;
- collect / extract, sperm ;
- use of donor, eggs / sperm ;
- fertilisation / described / IVF, outside the body / in a dish / in a laboratory ;
- embryo development in dish / AW ;

- screening of embryos ;
- inserting embryos into uterus ;
- give mother progesterone after inserting embryos (to maintain lining) ;

▼ **Describe the social implications of fertility treatments.**

1. treatments are expensive ;
2. idea that there are questions over who will fund treatments ;
3. risk of multiple, births / children / pregnancies ;
4. poor success rates ;
5. ref to emotional stress / ref to not knowing heritage ;
6. ethical / religious / cultural, issues, with fertility treatment process ;
7. allows people who have lost their partners to have children ;
8. allows people undergoing cancer treatment to have children ;
9. lower chance of genetic diseases if embryos screened ;
10. allows infertile people to have children ;
11. allows older people to have children ;
12. spare embryos can be used for, medical research / treatments / stem cells ;

▼ **Outline the role of FSH.**

- FSH stimulates, development / growth / maturation, of follicles (in ovary) ;
- FSH stimulates, development / growth / maturation, of, egg (cell) / ova / ovum / (female) gamete(s) ;
- FSH stimulates, production / release / secretion, of oestrogen (from ovary) ;

▼ **Outline the role of LH.**

- (FSH and) LH (surge) stimulates, ovulation / release of egg from ovary
- LH stimulates (corpus luteum / yellow body / empty follicle), secretion / production / release, of progesterone

- decrease in LH decreases secretion of progesterone (by corpus luteum) ;

▼ **Outline the role of oestrogen.**

- Stimulates the uterus to develop a lining (to replace the lining lost during menstruation)
- Post-ovulation, inhibits FSH and LH production in the pituitary gland.
- Stimulates secretion of LH.

▼ **Outline the role of progesterone.**

- maintains and thickens lining of the uterus
- inhibits FSH and LH production
- if fertilisation doesn't occur, levels drop and menstruation occurs.

▼ **Describe the changes that occur in the lining of the uterus during one menstrual cycle.**

- loss / thinning, of lining (of uterus), at the beginning of the cycle / during first week / between day 1–7 ;
- regrowth / thickening of, lining (of uterus), during second week / after loss (of lining) / before ovulation ;
- thickness of lining remains constant, in the last two weeks / at the end of the cycle / after ovulation / if no fertilisation ;
- ref. to, blood vessels / glands ;

▼ **Outline the use of fertility drugs.**

- FSH / LH (are used in fertility treatment) ;
- taken / injected, during early stage of menstrual cycle ;
- (FSH) stimulates follicles to, develop / mature ;
- (fertility drugs) stimulate, the ovaries / production of oestrogen ;
- (LH / FSH) stimulates, ovulation / described ;

▼ **Outline the use of contraceptives.**

- (contraceptives contain) progesterone (with oestrogen) ;

- decreases secretion / prevents release, of FSH / LH ;
- prevents, development / maturation of, follicles / eggs / ova ;
- prevents ovulation / described ;

▼ **Describe the social implications of the increased availability of the female contraceptive pill.**

lowers / controls, birth rate ;
 more choice over when to start a family ;
 fewer abortions / unwanted pregnancies / fewer adoptions ;
 more women in the workforce ;
 increased women in education ;
 increase in (named) STIs ;
 ref to religious views ;

▼ **Describe what happens at ovulation.**

an egg is released from the ovary into the oviduct.

▼ **Describe what happens after sperm reach the egg cell, till implantation.**

(acrosome) enzymes break down, jelly layer/AW ;
 sperm, head/ nucleus, enters egg ;
 fertilisation membrane forms / no more sperm can enter ;
 (haploid) nuclei, fuse/join ;
 (diploid) zygote formed ;
 mitosis / cell division ;
 (2 / more – celled) embryo forms ;
 (hollow) ball of cells / embryo/ zygote/fertilised egg, moves down the oviduct ;
 ciliary movement/ peristalsis, in the oviduct ;

▼ **What happens after implantation, in terms of hormones.**

- growth/ development, of placenta ;
- follicle becomes, yellow body / corpus luteum/remains of follicle/AW ;
- yellow body / corpus luteum/ ovary /AW, secretes /releases / produces
- progesterone ;
- progesterone maintains, endometrium/ lining of uterus /wall of
- uterus /AW ;

- progesterone, prevents menstruation ;
- inhibition of FSH (secretion/release) ;
- prevents, production of more eggs / production of follicles ;

▼ **State ways in which a sperm cell differs from an egg cell.**

- flagellum/ tail/ streamlined ;
- motile/ swim/AW ;
- smaller/reference to actual sizes ;
- acrosome/ enzymes in packet on head ;
- no food store ;
- less cytoplasm ;
- contains X or Y (chromosome) ;

Chapter 16

▼ **Define the term co-dominance.**

- both alleles are, expressed / neither allele is, dominant / recessive to the other ;
- the phenotype (of heterozygote is), intermediate / new / different / AW ;
- presence of multiple alleles, for one trait ;

▼ **Define the term allele.**

a version/ type, of a gene

▼ **Define the term sex-linked characteristic.**

- gene is located on, a sex chromosome / X or Y / X / Y ;
- characteristic is more common in, males / one sex (than the other) ;

▼ **Define the term phenotype.**

Observable features (of an organism)

▼ **Define the term inheritance.**

transmission of genetic information from generation to generation ;

▼ **Define the term chromosome.**

- (thread-like structure) made / length / strand / composed / molecule, of DNA ;
- carries / contains, genes / alleles / genetic information or material ;

Chapter 17

▼ **Explain what is meant by the term adaptive feature.**

- inherited/ genetic, feature
- result of natural selection in its habitat/ environment
- increases fitness
- increases chances of survival
- increase changes, of reproducing

▼ **Explain how protein in the cattle manure is converted to the type of ions that plants can absorb.**

- 1 protein, broken down / digested / decomposed, to amino acids ;
- 2 by decomposers / fungi / bacteria in terms (in context of breakdown of manure / protein) ;
- 3 ref to use of proteases ;
- 4 deamination (of amino acids / proteins) / described ;
- 5 production of, ammonia / ammonium ions / NH_3 / NH_4^+ ;
- 6 ammonium (ions), converted to, nitrite / nitrate (ions) / NO_3^- / NO_2^- ;
- 7 ref. to, nitrification / nitrifying bacteria ;
- 8 AVP ; e.g., nitrite to nitrate ions

▼ **Describe how eutrophication of streams and rivers can lead to the death of fish.**

- 1 breakdown / decomposition, of manure / AW ;
- 2 increase in (availability of named), ions (in streams/rivers) ;
- 3 (increased) growth of, (named) plants / producers / algae ;
- 4 increased competition for, light / AW ;
- 5 no photosynthesis causing death of, producers / plants / algae ;
- 6 increase in, (number of) bacteria / decomposers ;

7 respiration (by decomposers) reduces (dissolved) oxygen (leads to death of fish) ;

▼ **Explain the meaning of the term producer.**

autotrophic (organism) ;

organism that makes its own organic nutrients / food ;

(usually) using energy from the Sun / by photosynthesis

Chapter 18

▼ **Explain how natural selection differs from selective breeding/ artificial selection.**

- features are adaptive
- caused by environment
- slower changes
- increase in fitness
- explained: ability to survive AND reproduce (in natural environment)
- maintain (genetic) variation/ less (genetic) variation in selective breeding
- random mating

▼ **Explain how selective breeding/ artificial selection differs from natural selection.**

- human choice (rather than environmental pressures) / AW ;
- less, diversity / variation ;
- faster change ;
- AVP ; e.g. mating is not random

▼ **Suggest why selective breeding should continue for many generations**

- reduce variation (in a population) / create uniformity
- become more homozygous ;
- to, improve / maintain, the desirable feature ;

- produce more seeds ;
- AVP ; e.g. ensure trait continues on subsequent generations / to ensure no other alleles are present / does not result in unforeseen effects

▼ **Define population.**

- isolated group of individual animals
- of the same species
- living in the same place
- at the same time.

▼ **Define fitness.**

the probability of an organism will surviving and reproducing (in the environment in which it is found)

▼ **Explain the advantages of presenting information about food webs as a pyramid of biomass and not as a pyramid of numbers.**

- in a pyramid of numbers one large individual is shown in the same way as
- one very tiny individual ;
- biomass indicates how much food there is, available / left ;
- biomass is an indicator of the energy available ;
- pyramid of biomass is pyramid shaped whereas a pyramid of numbers is not always ;

▼ **Why something is a example of discontinuous variation?**

- distinct, phenotypes /categories ;
- no continuous range of phenotypes/ AW ;
- no intermediates
- controlled by genes ;
- not affected by the, environment / AW / named example ;

▼ **Suggest how herbicides damage ecosystems in a lake.**

kills, water plants / algae ;
lack of, producers / food for herbivores ;
bioaccumulation / described ;
reduced biodiversity ;
(lack of roots causes) erosion / silting / flooding ;

▼ **State why testosterone can improve sporting performance.**

- increases, muscle mass / strength / power ;
- improved recovery of muscle damage / promotes protein synthesis ;
- increase, competitive drive / aggression
- increases bone, density / mass ;

▼ **Outline the process of sewage treatment.**

1. (polluted) water piped, to sewage treatment works
2. screening / removal of, large pieces of waste ;
3. flocculation / coagulation, to separate suspended particles ;
4. settling of, particles / grit / gravel ;
5. digestion by, bacteria / fungi / decomposers / microorganisms ;
6. with aeration (tank) / trickle filter / activated sludge ;
7. sludge treated with anaerobic decomposers / anaerobic digestion ;
8. (water) treated with, chlorine / ozone / UV (light) ;
9. distillation / collection of water from evaporator ;

▼ **What are the sources of methane?**

- paddy fields / rice farming
- (named) animals / livestock
- decay / decomposition (by bacteria)
- rubbish tips / landfill
- sewage / dung / faeces
- (natural) gas extraction / fracking

- melting tundra
- waterlogged soil / swamp / marsh
- biomass burning / forest fires / peat fires

▼ **State adaptation of xerophytes.**

- Stem - swollen
- roots - extensive/ widespread/ shallow root system/ deep.

▼ **How xerophytes absorb sufficient water in the conditions in which they live.**

- deep roots / AW ;
- to absorb water from the water table / AW ;
- long and spread out below the surface ;
- to absorb water when it rains ;
- root cells have low water potential ;
- to absorb water by osmosis ;
- from (very) salty soils / AW ;
- roots branch many times ;
- have many roots hairs ;
- to give a large surface area (for absorption of water) ;

▼ **Explain how xerophytes are adapted to reduce water loss to the atmosphere.**

- few stomata / low stomatal density ;
- sunken stomata ;
- stomata close during the day and
- open at night ;
- rolled leaves ;
- thick epidermis / thick cuticle ;
- few / no / small, leaves ;
- hairs on leaves ;

- low rates of transpiration ;

▼ **Describe and explain adaptation of hydrophytes.**

- 1 submerged leaves are divided ;
 - 2 providing large area for, photosynthesis / absorption ;
- OR
- 3 leaves have large surface area ;
 - 4 to float ;
- OR
- 5 (floating leaves so) little xylem/ little lignin ;
 - 6 water provides support ;
- OR
- 7 little/ no roots /root hairs ;
 - 8 roots for anchorage only / no need for roots to absorb water or mineral ions ;
- OR
- 9 little/ no, cuticle ;
 - 10 no need to conserve water ;
- OR
- 11 stomata only on upper surface ;
 - 12 only upper surface exposed to air/ to allow diffusion of gases ;
- OR
- 13 lots of air spaces (between cells) ;
 - 14 for flotation/ buoyancy ;
- OR
- 15 floating leaves ;
 - 16 to allow, diffusion/AW of (named) gas(es) ;
- OR
- 17 aerial roots ;
 - 18 to allow roots to receive oxygen ;

▼ **How does nitrogen fixation occurs?**

By lightning and in root nodules

Chapter 19

▼ **What are the impact of monoculture on the environment?**

- loss of biodiversity
- outbreaks/ spreading of diseases/ pests/ plagues
- deforestation
- loss of habitats/ habitat destruction
- endangered/ extinction of species
- disruption of food chain
- disrupted soil fertility/ infertility of soil
- desertification
- soil erosion (by water/ wind)
- flooding
- increased pollution
- competition for resources
- disrupted nutrient cycling ;

▼ **Suggest reasons why a plant species can become endangered species.**

- competition from introduced species
- disease
- pollution
- lack of pollinators
- plant hunting
- deforestation
- climate change
- desertification
- increase in grazing

▼ **State reasons why a plant species could become endangered?**

- introduced species/ disrupted food chains
- diseases

- pollutants
- habitat destruction
- removing too many of a plant species
- extinction of other species/ fewer, pollinators/ pesticides killing pollinators/ reduced genetic diversity/ GM crops fight with the plant species in monoculture for nutrients.

▼ **Suggest reasons why a fish species can become endangered species.**

- introduced diseases / species ;
- (named) pollution ;
- habitat destruction ;
- food chain disrupted (described);
- (described) overfishing / hunting ;
- overconsumption (by humans) ;
- climate change ;

▼ **Suggest reasons why a animal species can become endangered species.**

- 1 habitat loss / deforestation ;
- 2 large mammals need large amounts of space ;
- 3 (named example of) climate change ; e.g. desertification

Use of land for

- 4 land developed for agriculture ;
- 5 land developed for, housing / transport / factories
- 6 land used for extraction of (named) material(s) ;
- 7 competing with humans for space ;

- 8 idea that populations are isolated ;
- 9 hunt / trophies / high value / poaching ;
- 10 laws are not enforced to protect from hunting ;
- 11 lack of education ;
- 12 poisoning / pollution ;

13 need a large quantity of food / lack of food sources / starvation ;

14 slow reproduction rate / hard to breed in captivity ;

▼ **Explain the risks to a plant species of having very small numbers.**

- high risk of extinction
- less reproduction
- high risk of genetic disease
- less variation
- small population so more vulnerable to diseases.
- reduced number of alleles
- less likely to adapt to change in environment

▼ **What are the disadvantage of captive breeding programme involving very small number of animals?**

- inbreeding
- less genetic variation
- reduced number of alleles
- increased risk of genetic disease
- can not reproduce
- not enough animals to breed
- less likely to adapt to change in environment
- cost

▼ **Describe the negative effects of acid rain on freshwater ecosystems, such as streams, rivers and lakes.**

- lake/ river pH decrease
- aluminium ions become mobile
- nutrients leached
- shell damage

- fish/ frog fail to reproduce
- aquatic plants die
- disruption of food chain
- loss of biodiversity
- low pH toxic to aquatic animals
- fish produce mucus which blocks gills.

▼ **What are the effects of acid rain on the environment?**

- reduces the pH of rivers / lakes / soils ;
- (low pH) kills / harms, fish/ invertebrates ;
- (low pH) causes aluminium compounds to become soluble ;
- aluminium compounds toxic to aquatic life ;
- kills / harms, trees / lichens /plants ;
- mineral/ s / ions / salts, washed out of soil ;
- damages limestone, buildings / statues /rock ;

▼ **Describe how acid rain destroys forests**

- lowers pH / acidifies soil ;
- (acidified soil) causes leaching ;
- burn / corrode / damage , leaves ;
- affects ability of roots to absorb mineral ions ;
- consequence of named mineral ion deficiency described ;

▼ **Why captive-breeding programs might fail?**

- killed by predators
- not able to find food
- more prone to diseases
- poaching
- low genetic variation

- competition with new species
- no survival instinct

▼ **IMP (Why it is more efficient for humans to eat plant than to eat animals.)**

If the question says, a human eats a plant and a human eats a animal who eats the same plant. explain why it is more effective for humans to eat plants. then answer the question in the following way.

Q. Soya beans are harvested from plants. Corned beef is produced from cattle that have fed on grass. Explain why it is more energy efficient for humans to eat soya products as a source of protein than corned beef. use the food chains involved to support your answer.

ANS → The last line (use the food chains involved to support your answer.) will not be given in every question.

But it is a good idea to first write both the food chains.

- soya → humans
- grass → cow → human

Start by saying that animal chain has an extra tropic level

- beef food chain has an extra level/ has extra link/ beef food chain longer

Then state that energy is lost

- Energy lost through food chain/ 90% energy lost at each level only 10% is transferred

State that in animal chain more energy is lost

- more energy is lost in beef chain

State how energy is lost in animal chain

- example of energy loss e.g. body heat/ movement of animal/ no all food digested/ energy lost in faeces/ urinating/ excretion/ respiration/ egestion

State that there is more biomass in plant than in animal.

- in food chain there is more biomass in soya than in cows.

IF the question is of three marks then write this:

- energy is lost, between/ within. tropic levels/ along food chain
- animals are, at secondary tropic level/ primary consumers OR plants are, autotrophs/ producers/ first tropic level
- (energy lost) in animal respiration/ heat/ (named) metabolic process/ movement
- ref to (more) material that is, inedible/ not digestible (in longer food chain)
- 10% energy transfer 90% energy loss
- livestock require additional resources/ cost of their maintenance.

▼ **State different reasons why forest are cut down?**

- for agricultural land
- timber for housing/ furniture/ wood/ paper/ fence posts
- timber for fuel
- to make roads, industry, housing, airports

▼ **Outline and explain the likely effect of clearing forests.**

- Soil erosion/ mudslides/ silting of rivers/ desertification/ dust bowl
- due to lack of trees roots to stabilise soil.
- Increased risk of flooding
- due to lack of trees to slow down water.
- Leaching of soil/ minerals washed out/ soil becomes infertile.
- Can lead to eutrophication of rivers/ lakes
- less photosynthesis/ burning or rotting wood
- less CO₂ absorbed from atmosphere/ more CO₂ produced/ in atmosphere
- global warming/ green house effect
- drop in oxygen in atmosphere
- less rain (change in weather)
- due to less transpiration

- reduction of habitats
- disruption of food chain
- so animals/ plants + can become extinct or number depleted/ loss of biodiversity
- ~~loss of genes/ sources of chemicals for medicines~~
- more pollution + due to smoke/ road traffic/ factories
- loss of income + tourism.

▼ **Outline the effects of deforestation on the environment**

- 1 soil erosion ;
- 2 flooding ;
- 3 landslides ;
- 4 leaching/ loss of nutrients ;
- 5 drought ;
- 6 desertification ;
- ~~7 increase in, frequency / severity of storms ;~~
- 8 loss of habitat ;
- 9 extinction/endangerment of species / loss of biodiversity ;
- 10 disruption of, food chains /food webs ;
- 11 burning of trees increases carbon dioxide in the atmosphere ;
- 12 decreased photosynthesis so, increased carbon dioxide/ decreased oxygen, in atmosphere ;

▼ **Describe how human actions are causing climate change.**

- more carbon dioxide is being released in the atmosphere
- carbon dioxide is produced by burning fossil fuels.
- deforestation leads to more carbon dioxide in atmosphere
- more methane is being released in the atmosphere
- methane is produced by farming
- methane is produced by landfills
- increased human population

- All of these causes enhanced green house effect
- green house gases like methane and carbon dioxide traps heat. increasing the average temperature of earth and causing climate change.

▼ How endangered species can be conserved?

- education / awareness ;
- monitoring / AW, population(s) / individual(s) ;
- habitat, protection / restoration ;
- reducing / prevention, of pollution ;
- removal / AW, of alien species ;
- hunting ban / prevent poaching ;
- international agreements to limit trade ;
- artificial insemination / IVF / use of surrogates / AW ;
- reintroduction programmes ;
- captive breeding / breeding programme (in situ or ex situ) ;
- preventing colonisation by alien species ;
- government / legislation, to protect species ;
- create, exclusion zones / reserves (so not disturbed by people) ;
- specific, times when / areas where, hunting / AW, not allowed ;
- removal to, zoos / botanical gardens / wildlife parks ;
- seed banks / frozen zoos / cryopreservation / AW ;

▼ How can we prevent overfishing?

1. education / awareness ; Accept commercials / advertising / tax consumer
2. reduced demand (to eat from unsustainable fish stocks) / public pressure / campaigning ;
3. steps taken by fisherman voluntarily / AW ;

4. (legal) quotas / treaties / licenses / laws / restricted catch weight ;
5. ensuring sustainable population size / recovery of, endangered / specific, species ;
6. **nursery zones (using this is much safer)/** no-catch zones / / protected areas / MPAs ;
7. overflow of target species / increase in population outside zone / breeding recovery
8. limited fishing season ;
9. stock recovery / optimises breeding seasons ;
10. fines;
11. discourage / punish, poor practice ;
12. restocking / captive breeding and release ;
13. increases gene pool / number of young / reproductively-viable, fish ;
14. fish farming ;
15. alternative source of fish ;

▼ **Explain why conservation of endangered animals is important?**

- maintains natural habitat/ prevent, human interference/ development
- prevention of extinction
- less, hunting/ poaching/ killing
- tourism/ economic reason
- maintain (bio)diversity/ genetic diversity
- maintain, gene, pool/diversity
- maintain, food chain/ balanced ecosystems
- available for scientific study
- retain for future generations

- maintain nutrient recycling
- maintain, resource provision/ food/ drugs
- prevent soil erosion/ flooding
- education

▼ **Explain why it is important to conserve ecosystems, such as wetlands**

1. to prevent extinction;
2. maintain biodiversity;
3. provide feeding grounds for animals / ref. to disruption of food, chains / web;
4. provide, breeding grounds / places for breeding;
5. provide, habitats / shelter;
6. vulnerable to the effects of, development / drainage / AW;
7. ref to flooding / natural disasters;
8. ref to nitrogen cycle;
9. ref to maintenance of water cycle;
10. ref to carbon cycle; e.g. greenhouse gas / carbon storage / carbon sink
11. waste disposal;
12. provide, resources / food / fuel / drugs / raw materials;
13. idea of areas for, recreation / (eco)tourism / education;
14. ethical reasons / aesthetic reasons / AW;
15. AVP; e.g. soil erosion

▼ **Define the term sustainable development.**

- development that provides for the needs of an (increasing) human (population) ;
- without harming the natural environment / ecosystems / habitat ;

▼ **Describe what is meant by sustainable resource, using forest as an example.**

- renewable
- resources does not/ will not, run out/ become exhausted

- replanting/ reseeding/ regrowing.

▼ **What are the reasons for decrease in aquatic animal population?**

- increased, predation ;
- disease ;
- lack of food ;
- migration ;
- (named) relevant pollution ;;
- (named) relevant environmental change ;;
- introduction of new species ;

▼ **Discuss the effects of non-biodegradable plastics on terrestrial ecosystems.**

- visual pollution ;
- chokes / strangles / traps / blocks digestive systems / AW (of animals)
- reference to, chemical exposure / fumes / toxins ;
- (plastic) accumulates in an organism / is passed down a food chain ;
- (described) habitat destruction ;
- e.g. plastic covers the habitats (plastic) blocks (light / water for) photosynthesis (for land plants) ;
- (plastic) block roots / prevents root growth ;
- remain in the ecosystem (for a very long time) ;

▼ **Describe the likely environmental problems caused by non-biodegradable plastic in streams and rivers.**

plastic **remains**/persists/lasts a long time/not decomposed ;
swallowed/ingested/**eaten**/cannot be digested/blocks gut ;
caught, around/strangle/**trapped**/entangled/smother/suffocate/injure/cut
/ trap/stuck in, organism AW ;
plastic blocks light for, photosynthesis ;
may, contain/release, (oil-soluble) toxins/poisons/harmful chemicals;
blocks the flow of water in streams or rivers ;
so less aeration of water/reduces concentration of (dissolved) oxygen ;
destruction of, habitat/ecosystem/food chain ;
idea of bioaccumulation/biomagnification ;
trapped / stationary water acts as a breeding site for mosquitoes ;
AVP ; e.g. visual pollution/releases hormone-like chemicals/less oxygen
from photosynthesis

▼ How eutrophication occurs?

1. fertiliser / nutrients, leached into / enter, rivers / streams / lakes ;
2. causing algal bloom / algae growth ;
3. algae block sunlight from entering water ;
4. so rooted plants unable to photosynthesise ;
5. so (rooted) plants die ;
6. bacteria, decompose / feed, on dead plants ;
7. so bacterial population increase ;
8. bacteria respire aerobically ;
9. bacteria use up the oxygen in the water ;
10. organisms / fish / creatures, die / suffocate / migrate, due to lack of oxygen ;

▼ Describe the causes of famine.

- lack of food supply / unequal distribution of food ;
- wars / sudden immigration, with inadequate resources for the population ;
- drought / floods, destroy crops / kill livestock ;
- disease in, food plants / animals ;
- poverty ;

▼ Describe the negative impact of intensive production of livestock.

1. loss of biodiversity ;

2. deforestation / habitat loss ;
3. release of, (named) greenhouse gases / carbon emissions ;
4. named consequence ; e.g. climate change / global warming
5. providing food for livestock requires monocultures ;
6. idea that livestock production is an inefficient use of, crop plants / energy
7. disease spreading to, wild populations / humans ;
8. use of antibiotics and (spread of) antibiotic resistance ;
9. effect of waste (faeces and urine) on, waterways / crops ;
10. use of pesticides ;

▼ **What are the advantages of intensive livestock farming?**

- cheaper and easier to produce
- lower costs for consumers
- easier to monitor and manage the animals
- quicker process of production
- higher yields of meat, dairy and eggs as animals are housed in smaller areas
- more efficient use of feed
- more efficient use of land
- better control over the animal's environment
- more predictable production levels

▼ **Explain the effects of soil erosion on ecosystems.**

1. silting of rivers ;
2. landslides / mudslides ;
3. soil does not absorb (rain)water / increased risk of flooding ;
4. increased rate of evaporation / land is exposed to drying ;
5. desertification / decreased soil water ;
6. reduction in transpiration ;

7. reduction in cloud formation ;
8. change in rainfall patterns ;
9. plants cannot grow (well) ;
10. idea that loss of anchorage for plants
11. idea of reduced (soil) fertility / increased leaching / AW ;
12. loss of, habitat / places where organisms live / described ;
13. disruption to food chain(s) / described ;
14. endangered / extinction / migration of, species ;
15. less, nutrient / nitrogen / carbon, recycling ;

▼ **Define ecosystem.**

a unit containing the community organisms and their environment interacting together.

▼ **Explain the benefits to other organisms of reducing deforestation and conserving trees.**

- food source(s) ;
- nesting / breeding, sites ;
- shelter / shade / protection from
- predators ;
- leaf litter for decomposers ;
- ref. to nutrient cycling ;
- (named) resources for humans ;

▼ **Describe how drought can contribute to famine.**

drought is a lack of, water / rainfall ;
destruction of, crops ;
seeds / plants, can't germinate ;
soil erosion / desertification ;
plants need water for photosynthesis ;

plants wilt ;
less, food / water, for livestock ;

▼ State and explain ways in which modern technology has resulted in increased food production.

- selective breeding qualified with feature e.g. increase in crop yield ;
- genetic engineering qualified with a correct feature ;
- use of antibiotics to increase yield (in livestock) ;
- agricultural machinery, to work larger fields /AW ;
- fertilisers, to increase plant growth/ provide mineral ions / salts / (named) nutrient ;
- pesticides / insecticides to kill pests to prevent crop destruction ;
- fungicides, to kill fungi to stop disease/reduce crop destruction ;
- herbicides to kills weeds to reduce competition ;

▼ Describe the effects of untreated sewage and excess fertiliser on aquatic ecosystems

- untreated sewage can lead to eutrophication;
- excess nutrients, such as nitrates and phosphates, can cause an algal bloom;
- it can block sunlight to rooted plants, making it difficult for plants to photosynthesise;
- this can cause a decrease in the number of rooted aquatic plants;
- this can reduce oxygen levels and can lead to a decrease in the biodiversity of an aquatic ecosystem;
- it can also lead to an increase in the population of bacteria which can lead to the spread of disease;
- it can also lead to an increase in the acidity of the water, making it difficult for aquatic organisms to survive.
- it can also cause an increase in the water temperature, leading to an increase in the number of harmful bacteria and other pathogens;

- it can also lead to an increase in the concentration of heavy metals, which can be toxic to aquatic organisms;

▼ **Explain how forests can be conserved.**

- Education / awareness, of the importance of forests ;
- Protected areas / reserves ;
- (Legal) quotas / treaties / licenses / laws / restricted to cut number of trees ;
- Removal of introduced species ;
- Ban deforestation ;
- International agreements to limit deforestation;
- Planting of, indigenous species / (native) trees, in forests ;
- Reforestation / replanting of, (native) trees ;
- Planting of, nitrogen-fixing species, to increase soil fertility ;
- Seed banks / frozen zoos / cryopreservation / AW ;

Chapter 20

▼ **List reasons for why bacteria and single-celled fungi are useful in biotechnology industries.**

- presence of plasmids
- rapid rate of reproduction
- no ethical consideration
- share same genetic code as other organisms
- ability to make complex molecules
- do not take up much space/ cheap to maintain culture.

▼ **Why it is important to stir the contents of the fermenter continuously.**

- even distribution of content
- ensure more access of bacteria with, medium

- prevent settling/ clumping of content
- so oxygen/ glucose/ nutrients dissolve
- so that growth is not limited
- so bacteria can absorb substances (more easily)
- bacteria need oxygen for respiration.

▼ **Describe the advantages of genetically modifying crops.**

- disease resistance ;
- large(r) / fast(er), yield ;
- drought resistance ;
- ref to more desirable, product / increased income / AW ;
- herbicide resistance ;
- pest / insect, resistance ;
- salt resistance ;
- frost resistance ;
- (named) nutritional enrichment ;
- vaccine production ;
- ref to benefits to, environment ;
- ref to a qualified benefit to humans ; e.g. food shortage / described
- health benefit
- AVP ; growth modification e.g. short stems / adaptations to extreme environments / rapid improvement to crop / improvements using characteristic that are not present in natural population

▼ **Describe the disadvantages of genetically modifying crops.**

- reduced natural biodiversity ;
- insect-resistant plants negatively affect pollinators ;
- cross-pollinate into wild populations ;

- (GM seeds are) expensive / AW ;
- seeds need to be bought each season
- ethical concerns of consumers ;