Triple Biology Knowledge quizzes June 2022

Tips:

- Learn one quiz at a time. Cover the right hand side and go through each question, checking the answers as you go.
- Get a friend or family member to quiz you – in random order
- When you are feeling confident, cover the right side and write the answers to all the ones you can, then check.

Cell structure

Question	Answer
1. What is the function of the cell membrane?	Control what enters and leaves the cell
2. Where in a cell does respiration take place?	Mitochondria
3. What is the function of the ribosomes?	Making proteins
4. Name 3 structures found in a plant cell but not in an animal cell	Vacuole, chloroplast, cell wall
5. In which part of a plant cell does photosynthesis take place?	Chloroplast
6. What is a prokaryote?	A cell with no nucleus
7. What is the cell wall of plants made of?	Cellulose
8. What is a eukaryote?	A cell that has its DNA in a nucleus
9. What is unique about bacterial cells?	Their DNA is free floating in cytoplasm . not in a nucleus
10. Name the circular ring of DNA found in many bacterial cells	Plasmid
11. What is the function of the cytoplasm?	Where many chemical reactions take place
12. What is stored in the vacuole of plant cells?	Sap
13. What is the function of the nucleus?	Contains the DNA
14. What are chromosomes made of?	DNA
15. In body cells, the chromosomes are found in…..	Pairs
16. What are the 3 stages of the cell cycle?	Interphase, mitosis, cytokinesis
17. What happens during interphase?	All the DNA is copied and so are all cell organelles like mitochondria, ribosomes etc
18. What happens during mitosis?	The chromosomes move to opposite sides, the nucleus divides
19. What happens during cytokinesis?	The cytoplasm and cell membranes divide
20. Why is mitosis important?	Growth and repair
21. What is a stem cell?	An unspecialized cell capable of becoming any type of cell
22. What is the name of the source of stem cells in plants?	Embryos
23. What type of cells can be obtained from stem cells in bone marrow?	Blood cells
24. Name two diseases that could be treated using stem cells	Paralysis and diabetes
25. What is the main source of stem cells from which all other cells can be made?	Meristem
26. What is a ‘cloned’ cell?	A cell that is identical to the parent cell
27. What is therapeutic cloning?	When the patients DNA is inserted into an egg cell to create embryonic stem cells that match the patients DNA
28. What is the advantage of being treated with cloned cells?	Less chance of rejection
29. Name one risk associated with cloned cells	Transfer of viral infections
30. Name 2 benefits of cloning plants	Producing crop plants with better yields, protecting plants from extinction

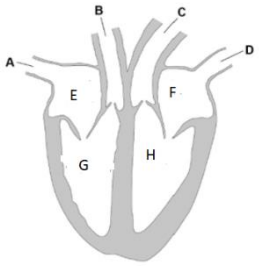
Animal tissues, organs and organ systems

Question	Answer
1. What are the 7 components of food?	Carbohydrates, proteins, fats, water, vitamins, minerals and fibre
2. Which food component provides us with most of our energy?	Carbohydrates
3. What is protein needed for in the diet?	Growth and repair
4. In which organ does digestion begin?	Mouth
5. What is an enzyme?	A protein that acts as a catalyst
6. Why does food need to be digested?	So that small soluble molecules can get across the membrane of the small intestine into the blood
7. Which enzyme is produced in the mouth?	Amylase
8. Which is the only enzyme found in the stomach?	Protease
9. Name two organs that produce and release all 3 digestive enzymes	Pancreas and small intestine
10. When amylase acts on starch, what is produced?	Glucose
11. What is produced when proteins are broken down?	Amino acids
12. Which enzyme digests proteins?	Protease
13. Which enzyme digests fats?	Lipase
14. What are the two products when fats are broken down?	Fatty acids and glycerol
15. Where is bile made?	Liver
16. Where is bile stored?	Gall bladder
17. What are the 2 functions of bile?	Neutralize stomach acid to produce the right conditions for the enzymes in the small intestine Emulsify fats (provide a larger surface area)
18. What is the function of stomach acid?	Kill bacteria in food
19. What chemical is used to test for starch?	Iodine
20. What is the colour change in the chemical named in Q19 if starch is present?	Brown to blue black
21. Which chemical is used to test for protein?	Biuret
22. Describe what you would see in a positive test for protein	Colour change from blue to purple/lilac
23. What colour is Benedicts solution?	Blue
24. What is Benedicts used to test for?	Glucose
25. What is the colour change in Benedicts if the test is positive?	Blue to brick red
26. What are the small molecules produced in digestion used for?	To build new carbohydrates, fats or proteins in the body. Glucose is used in respiration
27. How can the Benedicts test be heated safely?	Using a water bath
28. How can foods be tested for the presence of fat?	Add equal volumes of ethanol and water – if the water goes cloudy, fats are present
29. Name a food that is a good source of carbohydrate	Potatoes, rice, pasta, bread

30. What type of foods are good sources of protein?	Meat, fish, cheese, pulses

The heart and blood vessels

Question	Answer
1. What is the name of the top chambers of the heart?	Left and right atrium
2. What are the two bottom chambers called?	Left and right ventricles
3. Which blood vessels carry blood away from the heart?	Arteries
4. Why is the heart known as a 'double pump'?	Because the left side pumps to the body and the right side pumps to the heart
5. What is the name of the artery leaving the left ventricle to take blood to the whole body?	Aorta
6. Why are the valves in the heart?	To keep blood flowing one way and stop backflow
7. Where is the pacemaker located?	Right atrium
8. What is the name of the arteries that supply the heart itself with blood?	Coronary arteries
9. What is the name of the artery leaving the right ventricle to take blood to the lungs?	Pulmonary artery
10. What is the name of the blood vessel that brings blood to the heart from the body?	Vena cava
11. What is the name of the blood vessel that brings blood back from the lungs to the heart?	Pulmonary vein
12. What is the name of the main airway from the mouth to the lungs?	Trachea
13. The two airways that lead into the lungs are called….	Bronchi
14. Where in the lungs does gas exchange take place?	Alveoli
19. What is the function of the white blood cells?	Detect and destroy pathogens
20. What are the platelets for?	Clotting blood
21. Which blood vessels contain valves?	Veins
22. Which blood vessels have a strong elastic wall and thick layer of muscle to ensure blood is under high pressure?	Arteries
23. Which blood vessels have walls that are only one cell thick?	Capillaries
24. Which blood vessels carry blood under low pressure back to the heart?	Veins
25. How is the blood on the left side of the heart different from the blood on the right?	The blood on the left is higher in oxygen and lower in carbon dioxide



A ……Vena Cava

B ……pulmonary artery…….

C ……Aorta…….

D ……Pulmonary vein……..

E ……Right atrium……

F ……left atrium……..

G ……right ventricle……..

H ……left ventricle……..

Communicable diseases

Question	Answer
1. What is a communicable disease?	It is a disease that can be transmitted from one organism to another
2. What is a pathogen?	Any microorganism that can cause diseases
3. Name 4 different pathogens	Bacteria, virus, protist, fungi
4. How are pathogens spread?	They can be spread by air, water and direct contact
5. How do bacteria make you unwell?	They produce toxins that can damage tissues
6. Name two bacterial diseases	Salmonella and gonorrhea
7. How do viruses make you unwell?	They reproduce in cells, causing damage or death to the host cell
8. Name two viral diseases	HIV, measles
9. Name a viral disease that affects plants	Tobacco mosaic virus
10. Name the disease that causes discolour on plant leaves, which leads to a reduction in photosynthesis	Tobacco mosaic virus
11. What is a STD?	It is a sexually transmitted disease e.g. HIV/ gonorrhea
12. What are the symptoms of gonorrhea?	A thick yellow or green discharge from the penis or vagina and pain whilst urinating
13. What are the symptoms of Salmonella?	Fever, stomach cramps, vomiting and diarrhoea
14. How is Salmonella spread?	It is spread by eating food (poultry) prepared in unhygienic conditions
15. Describe an example of a plant fungal disease	Rose black spot- fungal disease that affects rose bushes. Black spots grow on leaves causing them to turn yellow and drop off. It prevents the leaves from photosynthesizing
16. How can plant diseases be identified?	Use the gardening websites and manuals and monoclonal antibody kits
17. What pathogen causes malaria?	Protist
18. What are the symptoms of malaria?	Recurrent episodes of fever, can lead to death
19. How can the spread of malaria be prevented?	Stop the vector, mosquitos from breeding and by using mosquito nets to avoid being bitten. This stops the protists from entering the host (human)
20. Name 3 ways to control the spread of communicable diseases	Good hygiene routines, vaccination, control vectors (isolate infected individuals)
21. Name mechanical defenses that protect plants from communicable diseases	Plants have thorns/ hairs or they have leaves that can droop or curl
22. How can aphids/ greenflies be controlled by gardeners?	Use pesticides or introduce a natural predator like ladybirds to eat them
23. What non- specific systems does the human body use to stop pathogens from getting in?	The body had skin, cilia and mucus in the nose, trachea and bronchi and acid in the stomach
24. What is the function of the white blood cells? (3)	Produces antibodies, produces antitoxins and phagocytosis
25. What is an antitoxin?	An antitoxin is a substance that neutralises toxins produced by pathogens by binding to them

26. What happens during phagocytosis?	A phagocyte (type of WBC) goes to the area of infection and engulfs a pathogen. It then releases enzymes to digest the pathogen
27. What is an antigen?	An antigen is a specific protein found on the surface of a pathogen
28. What does a vaccine contain?	It contains a small amount of the dead or weakened form of the pathogen
29. How does a vaccine work?	A vaccine stimulates the body to produce antibodies against a specific pathogen. If the same pathogen re-enters the body, WBC will quickly produce the correct antibodies to destroy the pathogen
30. Why are antibodies a specific defence?	Antibodies must be the correct shape for the pathogen's unique antigens, so they target a specific pathogen
31. What is herd immunity?	This is when most of a population is vaccinated against a disease, meaning the disease is less likely to spread and cause infection

Treatment of Diseases

Question	Answer
1. Which group of microbes can antibiotics kill?	Antibiotics
2. Where do many drugs come from initially?	Plants
3. What is a placebo?	A treatment that looks exactly the same as the one being trialled, but with no drug in
4. What is the first stage in testing a new drug?	Cells & tissues in the lab
5. What does the MMR vaccine protect against?	Measles, mumps & rubella
6. What is MRSA?	An antibiotic resistant bacteria
7. What is a 'double blind' trial?	A trial where neither the patients nor the doctors running the trial know who is getting the real drug and who is getting the placebo
8. What does the term 'efficacy' of a drug mean?	Efficacy means how well the drug works

Non- Communicable diseases

Question	Answer
9. Name four lifestyle factors associated with disease	Diet, smoking, exercise, stress, pollution levels
10. What is 'health'?	Health is a state of physical and mental well-being
11. What is a 'non-communicable disease'?	A non-communicable disease is one that is not caused by microbes and so cannot be passed on.

12. What is a 'benign' tumour?	A benign tumour is one that will not spread as it is contained within a capsule.
13. What is 'cardiovascular disease'?	Cardiovascular disease is any diseases of the heart or blood vessels
14. What do statins do?	Lower blood cholesterol
15. What is a 'stent'?	A tube that helps to prevent blood vessels or airways open
16. Why is it so important that heart valves work properly?	To keep blood flowing one way around the body
17. Name the two type of replacement heart valves.	Biological or mechanical
18. What is a 'carcinogen'?	Anything capable of causing cancer – e.g xrays, cigarette smoke

Monoclonal antibodies

Question	Answer
1. What is a clone of cells?	It is a group of identical cells that have formed from a single cell, which has repeatedly divided
2. What is a hybridoma?	A hybrid of a lymphocyte and tumour cell, which can divide and grow endlessly to produce antibodies
3. What is a lymphocyte?	It is a type of white blood cell that makes antibodies
4. How can monoclonal antibodies be used to target specific chemicals or cells?	Monoclonal antibodies are specific to a single binding site on a specific protein antigen
5. How are monoclonal antibodies used in research?	The are used to locate and identify specific molecules in cells and tissues
6. How are monoclonal antibodies used in diagnostic testing?	They are used to measure levels of hormones or chemicals in the urine or blood e.g. HCG in the urine to test for pregnancy
7. How are monoclonal antibodies used to treat cancer?	They deliver toxic chemicals and drugs directly to cancer cells and not healthy cells, so limiting the harm to them
8. Why are monoclonal antibodies not used as widely as anticipated?	They have more side effects than expected

Transport in cells

Question	Answer
1. What is diffusion?	Net movement of particles from an area of high concentration to an area of low concentration along a concentration gradient. This process does not require energy from respiration- i.e passive
2. Name 3 factors that affect the rate of diffusion	Temperature, the membrane surface area, concentration gradient
3. How are villi adapted for exchanging substances?	-Thin and long, increases surface area - membrane is one cell thick, so a short diffusion pathway - good supply of blood which maintains a steep concentration gradient
4. How are the lungs adapted for efficient gas exchange?	-alveoli have a large surface area - moist membranes that increase rate of diffusion membrane is one cell thick, so a short diffusion pathway - good supply of blood which maintains a steep concentration gradient
5. How are fish gills adapted for efficient gas exchange?	-Thin layer of cells creates a short diffusion pathway -large surface area for gases to diffuse across - good supply of blood which maintains a steep concentration gradient
6. Where does urea diffuse from?	From cells into the blood for excretion in the kidney
7. What is osmosis?	Diffusion of water molecules from an area of high concentration to an area of low concentration through a partially permeable membrane
8. What is a dilute solution?	A solution containing lots of water molecules and few solute molecules
9. What is a concentrated solution?	A solution containing few water molecules and a higher solute particles
10. Give an example of osmosis in a plant	Water moves from the soil into the root hair cell or water moves up the xylem tissue
11. What is active transport?	The movement of particles against a concertation gradient. For example, from a dilute solution to a more concentrated solution.
12. Where does the energy for active transport come from?	Respiration
13. What is the purpose of active transport in the small intestine?	It allows glucose to be absorbed when the concentration of glucose in the small intestine is lower than the concentration of glucose in the blood
14. Why is active transport needed in plant roots?	The concentration of mineral ions in the soil is lower than in the root hair cells, so the mineral ions must move against the concentration gradient to enter the root hair cell

Plant tissues, organs and systems

Question	Answer
1. Why is a leaf an organ?	There are many different tissues that work together inside a leaf to allow photosynthesis to occur
2. Name 3 different plant tissues	Any of- Epidermal, palisade, spongy mesophyll, xylem, phloem and meristem tissues
3. Where can the meristem tissue be found on a plant?	At the growing tips of shoots and roots
4. How is the upper epidermis adapted?	-it has cells that secrete a waxy cuticle that is waterproof and stops the leaf from drying out -it has a single layer of transparent cells that allow light to pass through it
5. How is the palisade mesophyll layer adapted?	It is tightly packed with chloroplasts to absorb as much light as possible for photosynthesis
6. How is the spongy mesophyll adapted?	It has air spaces to allow efficient gas exchange
7. What is the role of guard cells?	They open and close the stomata
8. Where are the guard cells found?	Lower epidermis
9. Where are stomata found?	Lower epidermis
10. What is the role of the stomata?	The stomata allow diffusion of oxygen and carbon dioxide in and out of the leaf
11. What is the function of the xylem?	The xylem transports water and mineral ions from the roots to the rest of the plant
12. What is the function of the phloem?	The phloem transports dissolved sugars from the leaves to the rest of the plant
13. State 3 ways the xylem is adapted	-it is made up of dead cells, there is no end wall between cells, the cell walls are strengthened by lignin allowing it to withstand water pressure
14. What is the purpose of translocation?	It allows the transport of dissolved sugars from the leaves to the other parts of the plant for processes such as growth, respiration and storage
15. What is transpiration?	Transpiration is the movement of water from the roots to the leaves via the xylem
16. Why is transpiration necessary?	It provides water to keep the cells turgid, provides cells with water for photosynthesis and transports mineral ions to the leaves
17. What factors affect the rate of transpiration?	Light intensity, temperature, humidity and wind speed
18. What effect does light intensity have on the rate of transpiration?	The higher the light intensity, the more carbon dioxide enters via the stomata for photosynthesis
19. What effect does humidity have on the rate of transpiration?	The higher the humidity, the lower rate of transpiration
20. What effect does temperature have on the rate of transpiration?	The higher the temperature, the higher the rate of transpiration

Bioenergetics

Question	Answer
1. Where in cells does respiration take place?	Mitochondria
2. When does respiration take place in plants and animals?	All the time
3. Write the word equation for respiration	Glucose + oxygen → carbon dioxide + water
4. What is glycogen?	Glycogen is a polymer of glucose – a way of storing glucose so that it can be broken down when needed
5. When do plants photosynthesise?	When it is light
6. Write the word equation for photosynthesis.	Carbon dioxide + water → glucose + oxygen
7. Name three factors that affect the rate of photosynthesis	Temperature, light intensity, carbon dioxide concentration
8. What is a 'limiting factor'?	The factor that is in the shortest supply for photosynthesis and is therefore holding the rate up
9. What is anaerobic respiration?	Respiration without the use of oxygen
10. What is metabolism?	Metabolism is the sum of all the chemical reactions in an organism
11.. Write the word equation for anaerobic respiration in plants and yeast.	glucose → ethanol + carbon dioxide
12. Describe how the oxygen and glucose enter the cells in the body	Oxygen and glucose enter the cells by diffusion from the blood – from an area of high concentration (the blood) to low concentration (the cells)
13.. Describe and explain the changes to breathing during exercise.	During exercise the breathing is faster and deeper. This is to get more oxygen in as it is needed for more respiration to take place to release more energy needed during exercise. It also removes the additional carbon dioxide being made.
14. Describe 3 uses for the energy released in respiration	Muscle contraction, keeping body temperature steady, making larger molecules from smaller ones.