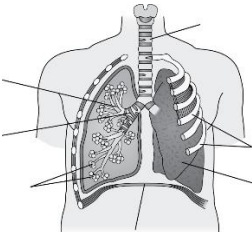
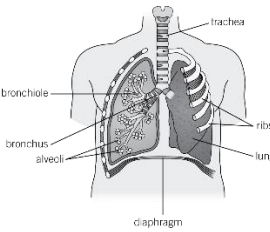
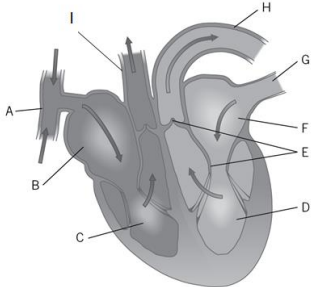


Core questions – Biology Unit 2 - Organisation

No	Question	Answer
1	What are cells?	The basic building blocks of all living organisms
2	What is a tissue?	A group of cells with a similar structure and function
3	What is an organ?	Aggregations of tissues performing specific functions
4	What is an organ system?	A group of organs, which work together to form organisms
5	What is a muscular tissue?	A tissue that contracts to move whatever it's attached to
6	What is a glandular tissue?	A tissue which makes and secretes chemicals like enzymes and hormones
7	What is an epithelial tissue?	A tissue which covers some parts of the body
8	What is a catalyst?	A substance which increases the speed of a reaction, without being changed or used up in the reaction
9	What is an enzyme?	A biological catalyst
10	What is the structure of an enzyme?	Large proteins made of chains of amino acids
11	What is the 'active site' on an enzyme?	A uniquely shaped section of the enzyme that only certain molecules will fit into
12	What is a 'substrate'?	The substance involved with the chemical reaction that fits into the enzyme
13	What is the 'lock and key' theory?	A specific substrate (the key) fits into the active site (lock) of the enzyme, breaking the bonds in the substrate
14	What two conditions can affect how an enzyme works?	Temperature and pH
15	What happens as the temperature of an enzyme controlled reaction increases?	The rate of reaction will also increase, but only until a certain temperature
16	Why does the enzyme stop working past a certain temperature?	The enzyme has become 'denatured'
17	What happens when an enzyme becomes 'denatured'?	The active changes shape, meaning it will no longer complement the correct substrate
18	How does pH affect enzymes?	Enzymes have an optimum pH. Anything above or below this will cause it to become denatured
19	What enzymes are involved with digestion?	Carbohydrase, lipase, protease
20	Why are enzymes important in digestion?	They break large molecules, that can't be absorbed into the blood stream, down into smaller molecules
21	What is the function of carbohydrases?	To break down carbohydrates to simple sugars
22	What is amylase?	A carbohydrase that breaks down starch
23	What is the function of protease?	To break down proteins into amino acids
24	What is the function of lipase?	To break down lipids (fats) into glycerol and fatty acids
25	Where is amylase produced?	Salivary glands (mouth), pancreas, small intestine
26	Where is protease produced?	Stomach, pancreas, small intestine
27	Where is lipase produced?	Pancreas, small intestine
28	What is the order in which food passes through the digestive system?	Mouth->oesophagus-> stomach-> small intestine->large intestine->rectum->anus

29	What is the function of the mouth in digestion?	To mechanically break up food into smaller pieces to increase surface area
30	What are two functions of saliva in digestion?	1. To moisten food to allow easier swallowing, 2. To start chemical digestion by containing salivary amylase
31	What is the function of stomach acid?	To kill potentially pathogenic microorganisms in food (NOT to digest food)
32	What is the function of the small intestine?	To absorb glucose, amino acids, vitamins and mineral ions from digested food
33	How are the small intestines adapted to carry out their function?	Small intestine has structures called villi which increase surface area
34	How are villi adapted to carry out absorption?	Large surface area, wall is only one cell thick, large blood supply
35	What is the function of the large intestine?	To absorb water from digested food
36	What is the function of the liver in digestion?	To produce bile
37	What is the function of the gall bladder?	To store bile until it can be released into the small intestine
38	What is the function of bile?	Neutralises hydrochloric acid from the stomach; Emulsifies (breaks down) fats to increase their surface area
39	What is the function of the rectum?	To store undigested material before excretion
40	What are the products of digestion used for?	Build new carbohydrates, lipids and proteins. Glucose is used for respiration
41	When practical steps are needed when testing for food molecules are present in different foods?	1. Break the food up using a pestle and mortar 2. Transfer to a beaker and add some distilled water 3. Stir the mixture 4. Filter the solution using a filter funnel and filter paper to get rid of any solids left
42	What reagent is used to test for reducing sugars?	Benedict's solution
43	What additional steps should be taken other than adding Benedict's solution to the food sample when testing for reducing sugars?	Place the mixture of Benedict's solution and food sample in a water bath set at about 75°C and leave for about 5 minutes
44	What is a positive result for reducing sugars?	Benedict's solution turns a brick-red colour (could also turn green or yellow if there is less sugar)
45	What reagent is used to test for protein?	Biuret solution
46	What is a positive result for proteins?	Biuret solution turns pink or purple
47	What reagent is used to test for lipids?	Sudan III
48	What reagent is used to test for starch?	Iodine solution
49	What is a positive result for starch?	Iodine solution turns a blue-black colour
50	Label the main structures in the respiratory system? 	

51	What is the function of the alveoli?	Increase surface area of the lung to maximise gas exchange
52	What is the function of the trachea?	Carries air to and from the lungs
53	What is the function of the bronchus? (plural = bronchi)	Carries air into and out of left or right lung
54	How are alveoli adapted to make gas exchange rapid and effective?	Spherical shape, very thin walls, lots of capillaries
55	Why does an alveolus have a spherical shape?	To give a large surface area
56	Why does an alveolus have very thin walls?	Gives a short diffusion distance for gas to travel in and out of the alveoli
57	Why are alveoli surrounded by lots of capillaries?	To provide a good blood supply to maintain a steep concentration gradient
58	What happens to the volume and pressure inside the chest when we breathe in?	Volume increases, pressure decreases
59	What happens to the volume and pressure inside the chest when we breathe out?	Volume decreases, pressure increases
60	<p>Identify the structures of the heart?</p> 	<p>A = vena cava B = right atrium C = right ventricle D = left ventricle E = valves F = left atrium G = pulmonary vein H = aorta I = pulmonary artery</p>
61	How many chambers does the heart have and what are they?	4 chambers. Atria and Ventricles
62	Which side of the heart carries oxygenated blood?	Left
63	Which side of the heart carries deoxygenated blood?	Right
64	Which blood vessel carries blood to the right atrium?	Vena cava
65	Where does the vena cava carry blood from?	The body
66	Which blood vessel carries blood away from the left ventricle and where does it go to?	Aorta to the body
67	Which side of the heart is made from thicker muscle and why?	Left, to pump blood all of the way around the body at high pressure
68	Which blood vessel returns blood to the left atrium?	Pulmonary vein
69	Where does the pulmonary artery carry blood from?	The lungs
70	Why does the heart pump blood to the lungs?	For gas exchange
71	Which blood vessel carries blood from the right ventricle and where does it go to?	Pulmonary artery to the lungs
72	What are the coronary arteries?	Blood vessels that supply the heart muscle tissue with oxygen
73	Where is the hearts pacemaker found and what is its function?	Groups of cells in the right atrium controlling natural heart rate
74	What is the role of an artificial pacemaker?	To correct irregularities in the heart rate

75	What is the function of the valves in the heart?	To prevent the backflow of blood.
76	How do you calculate the rate of blood flow?	Rate of blood flow (ml/min) = $\frac{\text{volume of blood (ml)}}{\text{number of minutes (mins)}}$
77	What are the 3 types of blood vessel?	Artery, vein and capillary
78	Which type of blood vessel carries blood away from the heart?	Artery
79	Which type of blood vessel carries blood towards the heart?	Vein
80	What is the lumen?	The inside space (in the blood vessels)
81	Describe the structure of a capillary?	The wall is only one cell thick; very small lumen
82	Why do capillaries have a small lumen and a wall that is one cell thick?	To allow substances to diffuse in and out very easily
83	Describe the structure of an artery?	Very thick walls made of smooth muscle with elastic fibres; small lumen
84	Why does an artery have thick muscular walls and elastic fibres?	Smooth muscle gives strength due to the high pressure of the blood and elastic fibres allow the artery to stretch and spring back.
85	Describe the structure of a vein?	Thinner, less muscular walls than arteries; large lumen; contain valves
86	Why do veins have thin walls with a large lumen?	Pressure of the blood is lower so thick walls are not needed and the larger lumen helps the blood to flow.
87	Why do veins have valves?	To stop blood flowing in the wrong direction
88	What is blood?	A tissue consisting of plasma, red blood cells, white blood cells & platelets
89	What is the function of the red blood cell?	Carries oxygen from the lungs to every cell in the body
90	How are red blood cells adapted to their function?	Large surface area; have no nucleus; contains haemoglobin which oxygen binds to easily
91	Why does a red blood cell not have a nucleus?	More space for more haemoglobin to carry more oxygen.
92	What is haemoglobin called when it is joined to oxygen?	Oxyhaemoglobin
93	What is the function of the white blood cells?	To defend us against pathogens
94	What are the 2 different types of white blood cell?	Lymphocytes & phagocytes
95	Which type of white blood cell engulfs microbes?	Phagocyte.
96	Which do Lymphocytes produce to defend us against infection?	Anti-bodies and anti-toxins.
97	What is the function of platelets?	Help blood clot around a wound to prevent microorganisms getting in
98	Which component of blood carries cells and other dissolved substances?	Plasma
99	What substances are carried in the blood plasma? (8)	Carbon dioxide, hormones, glucose, amino acids, urea, proteins, antibodies, antitoxins
100	What is cardiovascular disease?	Diseases of the heart and blood vessels
101	What is coronary heart disease?	Layers of fatty material build up inside the coronary arteries, narrowing them
102	Why is blocking the coronary artery a problem?	Blood flow is reduced to the heart therefore reduces the supply of oxygen for the heart muscle
103	How can CHD be treated?	Stent, statins
104	How do stents treat CHD?	Reopens the blocked coronary artery restoring blood flow
105	What are the advantages of using stents to treat CHD?	Effective for a long time and quick recovery time after surgery

106	What are the disadvantages of using stents to treat CHD?	Risk of complication or infection during the operation. Possible risk of blood clots near the stent
107	What can happen to heart valves if they become faulty?	Not open fully or develop a leak
108	What are the consequences of a faulty heart valve?	Blood may flow in both directions in the heart meaning blood doesn't circulate as effectively
109	Name 2 sources of replacement heart valves?	Mechanical or biological (e.g. pigs or sheep)
110	Name a treatment used in the case of total heart failure?	Heart transplant
111	Name a risk associated with surgical intervention in treating heart disease?	Infection, complications e.g. a heart attack and development of a blood clot.
112	When would an artificial heart be used?	To allow the heart to rest and recover and keep the patient alive whilst they wait for a transplant.
113	What are the advantages of having an artificial heart transplanted?	Less likely to be rejected
114	What are the disadvantages of using an artificial heart to treat CHD?	Parts could wear out, the electric motor could fail, blood moves through less smoothly leading to blood clots and strokes
115	How do statins treat CHD?	Decreases blood concentration of cholesterol, which reduces the build-up of fatty deposits in the coronary arteries
116	What are the advantages of using drugs (statins) to treat cardiovascular disease?	Reduces risk of strokes and heart attacks; increases good cholesterol and decreases bad cholesterol so reduces fatty deposit formation
117	What are the disadvantages of using drugs (statins) to treat cardiovascular disease?	Could forget to take them long term; side effects e.g. headaches, kidney failure, liver damage and memory loss; not an instant effect
118	What is "health"?	The state of physical and mental well-being
119	What are the two types of disease?	Communicable and non-communicable
120	What is a communicable disease?	A disease caused by a pathogen and can be spread
121	What is a non-communicable disease?	Any disease not caused by a pathogen, and can't be spread between organisms
122	Give examples of how communicable and non-communicable diseases can interact?	<ul style="list-style-type: none"> • Defects in the immune system mean that an individual is more likely to suffer from infectious (communicable) diseases. • Viruses (communicable) living in cells can be the trigger for cancers (non-communicable) • Immune reactions initially caused by a pathogen (communicable) can trigger allergies such as skin rashes and asthma (non-communicable) • Severe physical ill health can lead to depression and other mental illness.
123	What other factors, other than pathogens, influence health?	<ol style="list-style-type: none"> 1. Diet 2. Stress 3. Life situations
124	What is epidemiology?	Study of the incidence, distribution, and possible control of diseases and other factors relating to health
125	What is a risk factor?	A factor linked to an increased risk of disease

126	Give two general examples of a risk factor.	1. The lifestyle of a person 2. Substances in the person's body or environment
127	What is a correlation?	Where a change in one of two variables is reflected by a change in the other variable e.g increases in alcohol consumption = increase in incidence of breast cancer
128	What is a "causal mechanism"?	Where there is evidence from an investigation that links the risk factor to causing a particular disease.
129	What examples are there where a causal mechanism has been proven for some risk factors?	<ul style="list-style-type: none"> • The effects of diet, smoking and exercise on cardiovascular disease; • Obesity as a risk factor for Type 2 diabetes; • The effect of alcohol on the liver and brain function; • Carcinogens, including ionising radiation, as risk factors in cancer; • The effects of smoking and alcohol on unborn babies; • The effect of smoking on lung disease and lung cancer;
130	Most diseases are termed "multi-factorial". What does this mean?	Multiple risk factors contributing to the person developing the disease
131	What is the human cost of non-communicable disease?	Tens of millions of people die from non-communicable diseases each year
132	What is the financial cost of non-communicable disease?	<ul style="list-style-type: none"> • Researching and treating non-communicable disease costs the NHS millions of pounds • Families may have to move or adapt their homes if a family member gets ill • People may have to give up work which effects the countries economy
133	What is cancer?	The uncontrolled growth and division of cells
134	How do cancers develop?	DNA in cells is changed
135	What is a benign tumour?	A growth of abnormal cells which is contained in one area within the body and will not invade other body parts
136	What is a malignant tumour?	A growth of abnormal cells which invade neighbouring tissues and spread to different parts of the body in the blood where they form secondary tumours. Malignant tumour cells are cancers
137	What are the main <u>lifestyle</u> risk factors for cancer?	<ol style="list-style-type: none"> 1. Smoking (lung cancer) 2. UV exposure (skin cancer) 3. Obesity (bowel, liver and kidney cancer) 4. Viral infection can increase risk of certain cancers
138	Name another risk factor in the development of cancer.	Genetic
139	What are the main tissues of a plant?	Epidermal tissues, palisade mesophyll, spongy mesophyll, xylem and phloem, meristem
140	What is the function of epidermal tissues?	Covers the surfaces of the leaf and provides protection
141	How are epidermal tissues adapted to carry out their function?	Secretes a waxy substance that waterproofs the surface of the leaf
142	What is the function of palisade mesophyll tissues?	Main site of photosynthesis
143	How are palisade mesophyll tissues adapted to carry out their function?	Contains lots of chloroplasts in palisade cells
144	What is the function of spongy mesophyll tissues?	Allows the diffusion of gases

145	How are spongy mesophyll adapted to carry out their function?	Has large air spaces and a large surface area to make the diffusion of gases easier
146	What 3 organs for the plant transport system	Leaves, stems and roots.
147	What is the function of xylem?	Transports water and dissolved mineral ions
148	How are xylem adapted to carry out their function?	They are composed of hollow tubes strengthened by lignin
149	What is translocation?	The movement of sugars from the leaves to the rest of the plant.
150	What is the function of phloem?	Transports dissolved food from the leaves around the plant
151	How are phloem adapted to carry out their function?	Elongated cells with pores in the end cell walls to allow cell sap to move from one phloem cell to the next
152	What is the function of a root hair cell?	To absorb water by osmosis and minerals by active transport
153	How are root hair cells adapted to carry out their function?	Increases the surface area of the root
154	What is the role of stomata and guard cells?	To control gas exchange and water loss
155	When do the stomata open?	When the plant has lots of water
156	When do the stomata close?	When the plant is short of water
157	What is transpiration?	The movement of water from the roots to the leaves, eventually leaving the leaves via evaporation.
158	What are the four factors which affect the rate of transpiration in plants?	<ol style="list-style-type: none"> 1. Temperature 2. Humidity 3. Air movement 4. Light intensity
159	How does temperature effect the rate of transpiration in a plant?	The warmer it is, the faster transpiration happens. When it's warm the water particles have more energy to evaporate out of the stomata
160	How does humidity effect the rate of transpiration in a plant?	The drier the air around a leaf, the faster transpiration happens. Humidity increases the amount of water outside the leaf, so the concentration gradient between inside and outside the leaf is smaller.
161	How does air movement effect the rate of transpiration in a plant?	The stronger the wind, the greater the transpiration rate. Wind moves water particles away from the leaf, maintaining a steep concentration gradient for diffusion.
162	How does light intensity effect the rate of transpiration in a plant?	The brighter it is, the greater the transpiration rate. Photosynthesis doesn't happen in the dark so stomata close, meaning less water escapes.
163	What is a potometer?	A piece of apparatus to measure the rate of transpiration