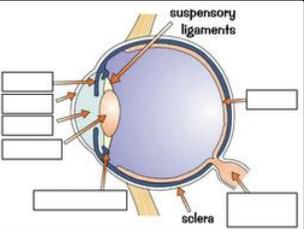
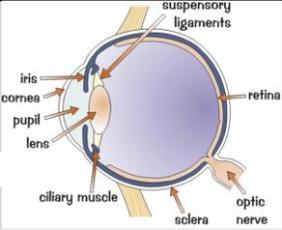


### Core questions – Unit 5 Biology – Homeostasis and response

No.	Question	Answer
1	What is homeostasis?	The regulation of the internal conditions of a cell or organism to maintain optimum conditions for function in response to internal and external changes
2	Why is homeostasis important for enzyme function?	It maintains optimum conditions for enzyme action
3	Give 2 examples of automatic control systems?	Nervous response or chemical response
4	What is the nervous system?	A system that enables humans to react to their surroundings and to coordinate their behaviour
5	What parts make up the nervous system?	Receptors, neurones, spinal cord/brain, effectors
6	What is a receptor?	Cells that detect a stimuli
7	What is a sensory neurone?	Neurones that carry electrical impulses from the receptors to the central nervous system
8	What is the central nervous system (CNS)?	The brain and the spinal cord
9	What is a motor neurone?	Neurones that carry electrical impulses from the CNS to effectors
10	What is an effector?	Muscles or glands, which bring about responses
11	What does a muscle do when stimulated?	Contract
12	What does a gland do when stimulated?	Secretes a hormone
13	What is a reflex action?	Automatic and rapid response to a stimuli that does not involve the conscious part of the brain
14	What is a reflex arc (list the order)?	Stimulus → receptor → coordinator → effector → response
15	What is a synapse?	The connection between two neurones
16	How is a nerve signal transferred across a synapse?	Chemicals diffuse across the gap
17	What can be used to measure human reaction time?	The ruler drop test
18	Why is it better to use a computer programme to measure human reaction time?	It removes human error making it more accurate and precise
19	What is the brain made of? <b>(Triple only)</b>	Billions of interconnected neurones and has different regions that carry out different functions
20	What are the different regions of the brain? <b>(Triple only)</b>	Cerebral cortex, cerebellum, medulla
21	What is the function of the cerebral cortex? <b>(Triple only)</b>	Controls consciousness, intelligence, memory & language
22	What is the function of the medulla? <b>(Triple only)</b>	Controls unconscious activities like breathing and your heartbeat
23	What is the function of the cerebellum? <b>(Triple only)</b>	Controls muscle coordination
24	What range of methods do scientists use to investigate the brain? <b>(Triple only)</b>	Study patients with brain damage already; electrically stimulate parts of the brain; use MRI scans
25	Why is it difficult to investigate brain function? <b>(Triple only)</b>	It is complex and delicate meaning it can be easily damaged, leading to problems with brain function
26	What is the eye? <b>(Triple only)</b>	A sense organ containing receptors sensitive to light intensity and colour

27	Label this picture of the <b>(Triple only)</b>		eye		
28	What is accommodation? <b>(Triple only)</b>	The process of changing the shape of the lens to focus on near or distant objects			
29	Describe the process of focussing on a near object? <b>(Triple only)</b>	<ul style="list-style-type: none"> <li>• The ciliary muscles contract</li> <li>• The suspensory ligaments loosen</li> <li>• The lens is then thicker and refracts light rays strongly</li> </ul>			
30	Describe the process of focussing on a distant object? <b>(Triple only)</b>	<ul style="list-style-type: none"> <li>• The ciliary muscles relax</li> <li>• The suspensory ligaments are pulled tight</li> <li>• The lens is then pulled thin and only slightly refracts light rays</li> </ul>			
31	What is myopia? <b>(Triple only)</b>	Short sightedness			
32	What is hyperopia? <b>(Triple only)</b>	Long sightedness			
33	How are vision defects corrected? <b>(Triple only)</b>	Spectacle lenses which refract the light rays so that they do focus on the retina; laser eye surgery			
34	How does the iris react to bright light? <b>(Triple only)</b>	Circular muscles in the iris contract and radial muscles relax, making the pupil smaller			
35	How does the iris react to dim light? <b>(Triple only)</b>	Radial muscles in the iris contract and circular muscles relax, making the pupil larger			
36	How is body temperature monitored and controlled? <b>(Triple only)</b>	By the thermoregulatory centre in the brain			
37	How are temperature changes detected in the body? <b>(Triple only)</b>	Receptors in the thermoregulatory centre detect changes in blood temperature; Temperature receptors in the skin send electrical impulses to the thermoregulatory centre			
38	How does the body respond when temperature is too high? <b>(Triple only)</b>	Blood vessels supplying skin capillaries dilate (vasodilation) Sweat is produced from the sweat glands			
39	How does the body respond when temperature is too low? <b>(Triple only)</b>	<ul style="list-style-type: none"> <li>• Blood vessels supplying skin capillaries constrict (vasoconstriction)</li> <li>• Sweating stops</li> <li>• Skeletal muscles contract rapidly (shivering)</li> </ul>			
40	Why does shivering warm us up? <b>(Triple only)</b>	When muscles contract, respiration increases, releasing more energy (some as heat)			
41	What is the endocrine system?	Composed of glands which secrete chemicals called hormones directly into the blood stream			
42	How are hormones transported in the body?	In the blood			
43	What is a hormone?	A chemical molecule, released from glands, affecting a target organ			
44	What are the main glands in the body?	Pituitary gland, thyroid, ovaries, testes, pancreas, adrenal gland			
45	What is the function of the pituitary gland?	Produces several hormones (known as the 'master gland')			
46	What is the function of the ovaries?	Produces oestrogen			
47	What is the function of the testes?	Produces testosterone			

48	What is the function of the thyroid?	Produces thyroxine
49	What is the function of the adrenal gland?	Produces adrenaline
50	What is the function of the pancreas?	Produces insulin
51	What are the differences between nerves and hormones?	<ul style="list-style-type: none"> <li>• Nerves act fast, hormones act slow</li> <li>• Nerves act for short period of time, hormones can act for long periods of time</li> <li>• Nerves act on a very precise area, hormones act in a more general way</li> </ul>
52	How is blood glucose levels monitored and controlled?	Through blood flow in the pancreas
53	Describe what happens when the blood glucose level is too high?	<ul style="list-style-type: none"> <li>• Blood glucose level detected by the pancreas</li> <li>• Pancreas releases insulin into the blood</li> <li>• Glucose is removed from the blood and stored as glycogen in the liver and muscles</li> </ul>
54	Describe what happens when the blood glucose level is too low? <b>(HT only)</b>	<ul style="list-style-type: none"> <li>• Blood glucose level detected by the pancreas</li> <li>• Pancreas releases glucagon into the blood</li> <li>• Glycogen is converted into glucose and released into the blood stream</li> </ul>
55	What is Type 1 diabetes?	A disorder in which the pancreas fails to produce sufficient insulin
56	What are the symptoms of Type 1 diabetes?	Uncontrolled high blood glucose levels
57	How is Type 1 diabetes treated?	Insulin injections
58	What is Type 2 diabetes?	When the body cells no longer respond to insulin produced by the pancreas
59	How is Type 2 diabetes treated?	A carbohydrate controlled diet and an exercise regime
60	What is a major risk factor for Type 2 diabetes?	Obesity
61	What substances in the body will affect the function of cells through osmotic changes? <b>(Triple only)</b>	Ions and water
62	Why does an imbalance of ions or water in the body negatively affect cells? <b>(Triple only)</b>	Too much water can enter or leave the cells through osmosis
63	How do ions and water leave the body? <b>(Triple only)</b>	Water leaves via the lungs through exhalation Water and ions are lost from the skin in sweat
64	What is the job of the kidneys? <b>(Triple only)</b>	To remove excess water, ions and urea in the urine
65	How is urea formed in the body? <b>(Triple only) (HT Only)</b>	<ul style="list-style-type: none"> <li>• Protein is broken down into amino acids</li> <li>• Amino acids are deaminated to form ammonia</li> <li>• Ammonia is toxic so is converted to urea</li> </ul>
66	Describe how the kidneys work? <b>(Triple only)</b>	Kidneys filter the blood (everything is removed, except proteins) Selective reabsorption – useful substances like glucose, ions and some water are absorbed back into the blood Urea is excreted in the urine
67	What is anti-diuretic hormones? <b>(Triple only) (HT only)</b>	Controls how much water is reabsorbed back into the blood

68	How is the water level in the body monitored and controlled? <b>(Triple only) (HT only)</b>	It is monitored in blood flow through the brain and controlled by ADH which is released by the pituitary gland
69	Describe what happens when water content in the body is too low? <b>(Triple only) (HT only)</b>	<ul style="list-style-type: none"> <li>• Receptor in the brain detects that the water content is too low</li> <li>• Pituitary gland releases more ADH</li> <li>• ADH makes the kidney tubules more permeable so more water is reabsorbed back into the blood</li> </ul>
70	Describe what happens when water content in the body is too high? <b>(Triple only)</b>	<ul style="list-style-type: none"> <li>• Receptor in the brain detects that the water content is too high</li> <li>• Pituitary gland releases less ADH</li> <li>• ADH makes the kidney tubules less permeable so less water is reabsorbed back into the blood</li> </ul>
71	What treatments can be offered to people with kidney failure? <b>(Triple only)</b>	Regular dialysis Transplant
72	How does a dialysis machine work? <b>(Triple only)</b>	<ul style="list-style-type: none"> <li>• Persons blood flows between partially permeable membranes surrounded by dialysis fluid</li> <li>• Dialysis fluid has the same concentration of dissolved ions and glucose as healthy blood</li> <li>• Waste substances like urea leave the persons blood through diffusion into the dialysis fluid</li> </ul>
73	Why do useful substances not leave the blood through dialysis? <b>(Triple only)</b>	The dialysis fluid contains the same concentration of useful substances as human blood
74	How often do dialysis sessions take place? <b>(Triple only)</b>	Three times a week, 3-4 hours each session
75	What are the disadvantages of kidney dialysis? <b>(Triple only)</b>	<ul style="list-style-type: none"> <li>• May cause blood clots or infections</li> <li>• Takes a long time</li> <li>• It is expensive</li> </ul>
76	What are the disadvantages of a kidney transplant? <b>(Triple only)</b>	<ul style="list-style-type: none"> <li>• It could be rejected by the recipients body</li> <li>• There are long waiting lists</li> </ul>
77	What are the stages of the menstrual cycle?	Stage 1 – Menstruation Stage 2 – The uterus lining builds up Stage 3 – The egg is released (ovulation) Stage 4 – The wall is maintained until menstruation
78	What is menstruation?	The uterus lining breaks down
79	What hormones are involved in the menstrual cycle?	Oestrogen, progesterone, FSH, LH
80	What reproductive hormones are produced in the ovaries?	Oestrogen and progesterone
81	What productive hormones are produced in the pituitary gland?	FSH & LH
82	What is the function of oestrogen?	<ul style="list-style-type: none"> <li>• Causes the lining of the uterus to grow</li> <li>• Stimulates the release of LH</li> <li>• Inhibits the release of FSH</li> </ul>

83	What is the function of progesterone?	<ul style="list-style-type: none"> <li>• Maintains lining of the uterus after an egg is released</li> <li>• When levels of progesterone fall the lining of the uterus breaks down</li> <li>• Inhibits the release of LH and FSH</li> </ul>
84	What is the function of LH?	Stimulates the release of an egg
85	What is the function of FSH?	<ul style="list-style-type: none"> <li>• Causes an egg to mature in one of the ovaries</li> <li>• Stimulates the ovaries to produce oestrogen</li> </ul>
86	What is hormonal contraception?	Use of hormones to prevent release of an egg
87	How can oestrogen be used as a contraceptive?	If taken regularly, it inhibits the production of FSH so egg development stops
88	How can progesterone be used as a contraceptive?	Stimulate the production of a thick mucus which prevents any sperm getting through to the egg
89	Describe how an oral contraceptive works?	Contains hormones to inhibit FSH production
90	Describe how an injection, implant or skin patch work?	Contains slow release progesterone to inhibit the maturation and release of eggs for a number of months or years
91	What is a barrier method of contraception?	Prevents the sperm reaching an egg
92	Name some barrier methods of contraception?	Condom, diaphragm
93	What is an intrauterine device (IUD)?	Prevents the implantation of an embryo. They can also release hormones.
94	What is a spermicide?	Something that kills or disables sperm
95	What is abstinence?	Not having sexual intercourse
96	What is sterilisation?	Cutting or tying the fallopian tubes in females, or the sperm duct in males
97	How can FSH and LH be used to increase fertility? <b>(HT only)</b>	By encouraging the maturation and release of an egg in females that have low levels of these hormones
98	Describe the process of In Vitro Fertilisation (IVF)? <b>(HT only)</b>	<p>Give the mother FSH and LH to stimulate the maturation of several eggs</p> <p>Collect the eggs and fertilise them artificially with sperm outside the womb</p> <p>Allow the fertilised egg to develop into embryos</p> <p>Insert one or two embryos back into the mother's uterus (womb)</p>
99	What are the advantages of IVF? <b>(HT only)</b>	Allows infertile couples to have a child
100	What are the disadvantages of IVF? <b>(HT only)</b>	<p>Multiple births (more likely to have twins/triplets)</p> <p>Success rate is low, making it emotionally stressful</p> <p>It can be physically stressful to the mother if they react to the hormones</p>
101	What is negative feedback? <b>(HT only)</b>	An automatic control system in the body that brings about changes when a set level (water, glucose) becomes too high or too low
102	What is adrenaline? <b>(HT only)</b>	A hormone produced by the adrenal glands in times of fear or stress
103	What is the function of adrenaline? <b>(HT only)</b>	Increases heart rate and boosts the delivery of oxygen and glucose to the brain and muscles
104	What is thyroxine? <b>(HT only)</b>	A hormone released by the thyroid glands that stimulates the basal metabolic rate
105	What is the basal metabolic rate? <b>(HT only)</b>	The speed at which chemical reactions in the body occur while the body is at rest

106	How are thyroxine levels controlled? <b>(HT only)</b>	Thyroxine is released in response to thyroid stimulating hormone (TSH) is released from the pituitary gland
107	Describe what happens when levels of thyroxine in the blood are higher than normal? <b>(HT only)</b>	TSH release from the pituitary gland is inhibited. This reduces the amount of thyroxine released from the thyroid gland
108	Describe what happens when levels of thyroxine in the blood are lower than normal? <b>(HT only)</b>	TSH release from the pituitary gland is stimulated This increases the amount of thyroxine released from the thyroid gland
109	What is auxin? <b>(Triple only)</b>	A plant hormone that controls growth near the tips of shoots and roots
110	What stimuli do plants respond too? <b>(Triple only)</b>	Light (phototropism), gravity (gravitropism or geotropism)
111	How does auxin respond to light in the shoots? <b>(Triple only)</b>	More auxin accumulates on the side that's in the shade The cells in the shade grow faster, so the shoot bends towards the light
112	How does auxin respond to gravity in the shoots? <b>(Triple only)</b>	When shoots grow sideways, auxin accumulates on the lower side of the tip The cells on the lower side to grow faster, so the shoot bends upwards
113	How does auxin respond to gravity in the roots? <b>(Triple only)</b>	When roots grow sideways, auxin accumulates on the lower side of the root The cells on the lower side grow <b>slower</b> , so the root bends downwards
114	What are Gibberellins? <b>(Triple only) (HT only)</b>	Plant hormones important in initiating seed germination
115	What is Ethene? <b>(Triple only) (HT only)</b>	A gas produced by aging parts of plants – it controls cell division and ripening of fruits
116	How are auxins used in agriculture and horticulture? <b>(Triple only) (HT only)</b>	As weed killers – by disrupting normal growth patterns As rooting powders For promoting growth in tissue culture
117	How is Ethene used in the food industry? <b>(Triple only) (HT only)</b>	To control ripening of fruit during storage and transport
118	How are Gibberellins used in agriculture and horticulture? <b>(Triple only) (HT only)</b>	To end seed dormancy – make seed germinate at times of the year that they wouldn't usually Promote flowering Increase fruit size