

## Golden Knowledge Multiple Choice Question sheet: Topic 5: Homeostasis (TRILOGY COURSE)

Use the table below to help you identify which questions are for each lesson / section of learning within this topic:

Lesson Ref	Specification ref (Trilogy)	Lesson content	Question numbers
B10.1	5.1	Principles of homeostasis	1-5
B10.2	5.2.1	The structure and function of the nervous system	6-10
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RP7		Required practical 7 - Reaction time	14-16
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1. What is the definition of homeostasis in biology?
  - a) The process of breaking down enzymes
  - b) The maintenance of a stable internal environment
  - c) The rapid multiplication of cells
  - d) The production of hormones
2. What are the optimal conditions for enzyme action?
  - a) A wide range of temperatures and pH levels
  - b) Extreme acidity and low temperatures
  - c) Specific temperature and pH ranges
  - d) Constant fluctuations in pH
3. What is the primary role of automatic control systems in the body?
  - a) To prevent any response to changes
  - b) To maintain a constantly high body temperature
  - c) To regulate internal responses to external changes
  - d) To produce enzymes
4. Which co-ordination centre is responsible for rapid reflex actions, such as quickly pulling your hand away from a hot object?
  - a) The brain
  - b) The spinal cord
  - c) The heart
  - d) The lungs

5. What are the effectors responsible for in response to changes in the body?
  - a) Maintaining optimal conditions for enzyme action
  - b) Initiating the homeostatic response
  - c) Producing hormones
  - d) Detecting changes in the external environment
  
6. What do receptor cells do in the body's control systems?
  - a) They carry out responses to stimuli
  - b) They transmit nervous impulses
  - c) They detect changes in the internal or external environment
  - d) They produce hormones
  
7. How is the structure of the nervous system adapted to its functions?
  - a) By having a complex network of blood vessels
  - b) By using only chemical signals
  - c) By having a simple structure for faster responses
  - d) By consisting of specialized cells for detecting and transmitting information
  
8. Why is the nervous system essential for a person's health and survival?
  - a) To regulate the circulatory system
  - b) To control growth and development
  - c) To detect and respond to changes in the environment
  - d) To produce antibodies
  
9. What is the mechanism of a nervous impulse signal and response?
  - a) Electrical signals travel along the axon and trigger the release of neurotransmitters
  - b) Hormones are released and transported in the bloodstream
  - c) Receptor cells produce a chemical response
  - d) The brain processes all stimuli at once
  
10. What are the functional properties of effectors in response to a stimulus?
  - a) Effectors inhibit the response to a stimulus
  - b) Effectors amplify the stimulus
  - c) Effectors carry out the response, such as muscle contraction or hormone secretion
  - d) Effectors detect changes in the external environment
  
11. What structures are involved in a reflex arc?
  - a) Only the brain
  - b) Muscle tissue
  - c) Nerve cells, spinal cord, and muscles
  - d) Sense organs and the heart
  
12. Why are reflex actions important for the body?
  - a) They allow for conscious decision-making
  - b) They protect the body by providing rapid, automatic responses to potential harm
  - c) They control long-term memory
  - d) They increase the heart rate
  
13. What are the key characteristics of reflex actions?
  - a) They involve conscious thought and are slow
  - b) They only occur in response to external stimuli
  - c) They are automatic and occur rapidly
  - d) They require complex decision-making processes

14. In a scientific investigation of human reaction time, what would be a suitable dependent variable?
- The factor being investigated
  - The participant's age
  - The time it takes for a person to complete a puzzle
  - The colour of the lab equipment
15. To investigate the effect of a factor on human reaction time, what is a necessary step?
- Make assumptions without experimentation
  - Choose a factor that has no impact on reaction time
  - Plan and carry out a controlled experiment
  - Study unrelated topics
16. What is the key objective of carrying out an investigation into human reaction time?
- To increase reaction time in participants
  - To prove a hypothesis without evidence
  - To identify the impact of a specific factor on reaction time
  - To create a distraction from the research process
36. What are the principles of hormonal co-ordination related to?
- Conducting electricity in the body
  - Regulating body functions using chemicals
  - Controlling muscle movements
  - Sensory perception
37. What is the main composition of the endocrine system?
- Bones and muscles
  - Nerves and electrical signals
  - Glands and hormones
  - Blood and oxygen
38. What defines a hormone?
- A chemical that can take any shape
  - A protein with no specific function
  - A chemical messenger made from protein with a specific shape
  - A small piece of bone
39. How does a hormonal response compare to a nervous system response?
- Hormonal responses are faster and shorter
  - Hormonal responses are slower and act longer
  - Nervous system responses are slower and act longer
  - There is no difference; they are the same
40. What is the pituitary gland often referred to in the context of the endocrine system?
- The muscular gland
  - The fast-response gland
  - The master gland
  - The digestive gland
41. Which of the following hormones are typically secreted by the pituitary gland?
- Insulin and glucagon
  - Oestrogen and testosterone
  - Thyroxine and adrenaline
  - Human growth hormone and antidiuretic hormone

42. How can the presence of one hormone influence the secretion of other hormones by different glands?
- It has no influence on other hormones
  - It leads to decreased hormone production
  - It can stimulate other glands to release their hormones
  - It causes immediate hormone breakdown
43. Where can you locate endocrine glands in the body?
- In the circulatory system
  - Attached to bones
  - Throughout the digestive tract
  - Scattered throughout the body
44. How is blood glucose concentration monitored and controlled in the body?
- By the heart
  - By the liver
  - By the pancreas
  - By the lungs
45. What does the pancreas do when blood glucose concentration is too high?
- It secretes insulin into the blood
  - It secretes glucagon into the blood
  - It has no effect on blood glucose levels
  - It stops producing hormones
46. Why is insulin necessary for cells in the body?
- To make cells grow larger
  - To produce more blood glucose
  - To absorb glucose from the blood
  - To release glucose into the blood
47. What is the primary effect of insulin on liver and muscle cells?
- It inhibits glucose absorption
  - It stimulates the release of glucose
  - It allows cells to absorb glucose
  - It prevents glucose storage
48. How does insulin regulate blood glucose levels?
- By increasing blood glucose concentration
  - By stimulating glucagon production
  - By promoting glucose uptake by cells
  - By causing the pancreas to stop functioning
49. What hormone does the pancreas produce when blood glucose concentration is too low?  
(HIGHER)
- Glucose
  - Fructose
  - Sucrose
  - Glucagon
50. What is the effect of glucagon on glycogen and blood glucose concentration? (HIGHER)
- It converts glycogen to glucose and increases blood glucose concentration
  - It converts glucose to glycogen and decreases blood glucose concentration
  - It promotes glycogen formation and decreases blood glucose concentration
  - It has no impact on glycogen or blood glucose levels

51. How is the control of blood glucose levels maintained through a feedback cycle involving glucagon and insulin? (HIGHER)
- By positive feedback
  - Through negative feedback
  - Through constant insulin secretion
  - Without involving any hormones
52. What is diabetes in relation to blood glucose control?
- A condition where blood glucose is internally controlled
  - A condition where blood glucose is externally controlled
  - A condition unrelated to blood glucose levels
  - A condition causing blood glucose to decrease
53. How many types of diabetes are there?
- One
  - Two
  - Three
  - Four
54. What is the primary cause of Type 1 diabetes?
- Obesity
  - Genetics and autoimmunity
  - Diet and lifestyle
  - Infection
55. How is Type 1 diabetes typically treated?
- Through dietary changes
  - With lifestyle modifications
  - Using insulin injections or pumps
  - By taking oral medications
56. What is the primary cause of Type 2 diabetes?
- Genetics
  - Autoimmunity
  - Lack of insulin production
  - Insulin resistance due to lifestyle factors
57. What is the main treatment option for Type 2 diabetes?
- Insulin injections
  - Diet and exercise
  - Autoimmune therapy
  - Organ transplant
58. How can treatment options for Type 1 and Type 2 diabetes be compared?
- By their cost
  - By their dietary restrictions
  - By their reliance on insulin
  - By their impact on insulin resistance
59. What is the relationship between obesity and diabetes?
- Obesity has no effect on diabetes
  - Obesity always causes Type 1 diabetes
  - Obesity is a risk factor for Type 2 diabetes
  - Obesity prevents diabetes

60. When evaluating information about obesity and diabetes, what should one consider?
- Ethical issues
  - Only the financial cost
  - Only personal preferences
  - None of the above
61. What should you take into account when making recommendations about diabetes and obesity?
- Social and ethical issues
  - Only personal preferences
  - Only scientific studies
  - Only financial cost
62. What is the role of glucagon in the negative feedback cycle controlling blood glucose? (HIGHER)
- It decreases blood glucose levels
  - It increases blood glucose levels
  - It has no effect on blood glucose
  - It regulates blood pressure
63. What is the role of thyroxine in the body? (HIGHER)
- It regulates blood glucose levels
  - It controls heart rate
  - It influences metabolism and growth
  - It stimulates insulin production
64. How does adrenaline affect the body? (HIGHER)
- It lowers heart rate
  - It reduces respiration rate
  - It prepares the body for a fight or flight response
  - It promotes digestion
65. What happens to the rate of aerobic respiration when the heart rate increases? (HIGHER)
- It decreases
  - It remains the same
  - It increases
  - It stops entirely
66. When interpreting diagrams of negative feedback control systems, what is the main purpose? (HIGHER)
- To confuse the reader
  - To simplify the process
  - To understand how the system maintains stability
  - To learn about unrelated topics
67. What causes the development of secondary sex characteristics during puberty in both males and females?
- Increased growth hormone
  - Reproductive hormones
  - Nutritional factors
  - Environmental conditions
68. Which hormone is responsible for its effect on the male reproductive system, including the growth of facial hair and a deeper voice?
- Oestrogen
  - Progesterone
  - Testosterone
  - Insulin

69. What is the main function of oestrogen in the female reproductive system?
- Promoting the development of male secondary sex characteristics
  - Regulating the menstrual cycle and promoting female secondary sex characteristics
  - Stimulating the growth of facial hair
  - Controlling blood glucose levels
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  - Regulating the menstrual cycle and promoting female secondary sex characteristics
  - Stimulating the growth of facial hair
  - Controlling blood glucose levels
73. What is the approximate duration of the menstrual cycle in most females? (HIGHER)
- 7 days
  - 14 days
  - 28 days
  - 60 days
74. During the menstrual cycle, what does a follicle mature into? (HIGHER)
- A zygote
  - A sperm cell
  - An ovum (egg)
  - A placenta
75. Which hormone is responsible for triggering ovulation during the menstrual cycle? (HIGHER)
- Oestrogen
  - Progesterone
  - Luteinizing hormone (LH)
  - Follicle-stimulating hormone (FSH)
76. What is the main role of progesterone in the menstrual cycle? (HIGHER)
- To stimulate the release of the egg
  - To build up the uterine lining for potential pregnancy
  - To trigger the release of FSH
  - To promote the development of ovarian follicles
77. Which of the following hormones peaks just before ovulation? (HIGHER)
- Oestrogen
  - Progesterone
  - Luteinizing hormone (LH)
  - Follicle-stimulating hormone (FSH)

78. How many primary hormones are involved in regulating the menstrual cycle? (HIGHER)
- 1
  - 2
  - 3
  - 4
79. What is the primary function of hormonal methods of contraception?
- To prevent sexually transmitted infections
  - To delay the onset of menopause
  - To regulate the menstrual cycle
  - To prevent pregnancy
80. Which of the following is an example of a non-hormonal method of contraception?
- Birth control pills
  - Intrauterine device (IUD)
  - Condom
  - Morning-after pill
81. When evaluating the use of contraceptive methods, which of the following aspects should be considered?
- Taste and texture
  - Brand popularity
  - Personal, social, economic, and environmental implications
  - Availability of over-the-counter options
82. What is the significance of making informed decisions about contraceptive methods?
- To increase the cost of contraception
  - To reduce access to contraceptives
  - To promote unplanned pregnancies
  - To prevent unintended consequences and make responsible choices
83. In modern reproductive technologies, what is the primary use of hormones in treating infertility? (HIGHER)
- To prevent pregnancy
  - To regulate menstrual cycles
  - To enhance fertility and stimulate egg production
  - To treat common colds
84. What are the benefits of fertility drugs in the context of infertility treatment? (HIGHER)
- They are a guaranteed solution to infertility
  - They have no side effects
  - They help stimulate the release of multiple eggs
  - They are a replacement for in vitro fertilization (IVF)
85. Which of the following best describes the process of in vitro fertilization (IVF)? (HIGHER)
- A surgical procedure to remove the fallopian tubes
  - The implantation of a fertilized egg into the uterus
  - Fertilization of an egg outside the body, followed by embryo implantation
  - A method of contraception
86. When evaluating treatments for infertility, which aspects should be considered? (HIGHER)
- Brand popularity
  - Colour of the clinic's walls
  - Social, ethical, and procedural implications
  - Availability of home remedies



87. In IVF, where does fertilization of the egg occur before embryo implantation? (HIGHER)

- a. In the mother's fallopian tube
- b. In a laboratory dish
- c. In the uterus
- d. In the cervix

88. When evaluating social implications of infertility treatment, what might be a concern? (HIGHER)

- a. The colour of the clinic's walls
- b. The age of the clinic's receptionist
- c. The impact on family dynamics and relationships
- d. The availability of parking near the clinic

**Marksheet – Fill in your answers using this grid:**

Qn	Answer	Correct	Check
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Qn	Answer	Correct	Check
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Qn	Answer	Correct	Check
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Total			/69

## **Feedback and Review**

*Reviewing and providing feedback on your GCSE biology questions is an important part of the learning process. Here's a list of tasks to help you effectively review and learn from the content you didn't know:*

**Identify Weak Areas:** Go through the questions you answered and identify the specific topics or concepts you struggled with.

**Revisit the Questions:** Re-read the questions you answered incorrectly to understand the context and what was expected in your response.

**Consult Textbooks and Notes:** Refer to your GCSE biology textbooks, revision guides and class work to find information related to the topics you found challenging.

**Online Resources:** Use online resources and educational websites, videos, or articles to gain a deeper understanding of the topics you struggled with. Ask if you are unsure which to use.

**Create a Summary:** Summarize the key points for each topic or concept in your own words. This will help reinforce your understanding.

**Practice Problems:** Look for additional practice questions or worksheets related to the weak areas you identified and attempt them.

**Flashcards:** Create flashcards for important terms, definitions, and concepts. Use them for quick and effective review.

**Mind Maps:** Create visual mind maps or concept maps to connect related ideas and concepts. This can help you see the bigger picture.

**Teach Someone Else:** Explaining what you've learned to a friend or family member can be an effective way to reinforce your understanding.

Use the summary box below to annotate the ideas and information that you must use to provide your own feedback on what you are going to do next to develop and enhance your learning of this content:

**Golden Knowledge Multiple Choice Question sheet: Topic 5: Homeostasis (TRILOGY COURSE)****Answers**

1	b) The maintenance of a stable internal environment
2	c) Specific temperature and pH ranges
3	c) To regulate internal responses to external changes
4	b) The spinal cord
5	b) Initiating the homeostatic response
6	c) They detect changes in the internal or external environment
7	d) By consisting of specialized cells for detecting and transmitting information
8	c) To detect and respond to changes in the environment
9	a) Electrical signals travel along the axon and trigger the release of neurotransmitters
10	c) Effectors carry out the response, such as muscle contraction or hormone secretion
11	c) Nerve cells, spinal cord, and muscles
12	b) They protect the body by providing rapid, automatic responses to potential harm
13	c) They are automatic and occur rapidly
14	c) The time it takes for a person to complete a puzzle
15	c) Plan and carry out a controlled experiment
16	c) To identify the impact of a specific factor on reaction time
36	b) Regulating body functions using chemical messengers
37	c) Glands and hormones
38	c) A chemical messenger made from protein with a specific shape
39	b) Hormonal responses are slower and act longer
40	c) The master gland
41	d) Human growth hormone and antidiuretic hormone
42	c) It can stimulate other glands to release their hormones
43	d) Scattered throughout the body
44	c) By the pancreas
45	a) It secretes insulin into the blood
46	c) To absorb glucose from the blood
47	c) It allows cells to absorb glucose
48	c) By promoting glucose uptake by cells
49	d) Glucagon
50	a) It converts glycogen to glucose and increases blood glucose concentration
51	b) Through negative feedback
52	b) A condition where blood glucose is externally controlled
53	b) Two
54	b) Genetics and autoimmunity
55	c) Using insulin injections or pumps
56	d) Insulin resistance due to lifestyle factors
57	b) Diet and exercise
58	c) By their reliance on insulin
59	c) Obesity is a risk factor for Type 2 diabetes
60	a) Ethical issues
61	a) Social and ethical issues
62	b) It increases blood glucose levels
63	c) It influences metabolism and growth
64	c) It prepares the body for a fight or flight response

65	c) It increases
66	c) To understand how the system maintains stability
67	b) Reproductive hormones
68	c) Testosterone
69	b) Regulating the menstrual cycle and promoting female secondary sex characteristics
70	b) Reproductive hormones
71	d) Testosterone
72	b) Regulating the menstrual cycle and promoting female secondary sex characteristics
73	c) 28 days
74	c) An ovum (egg)
75	c) Luteinizing hormone (LH)
76	b) To build up the uterine lining for potential pregnancy
77	a) Oestrogen
78	c) 3
79	d) To prevent pregnancy
80	c) Condom
81	c) Personal, social, economic, and environmental implications
82	d) To prevent unintended consequences and make responsible choices
83	c) To enhance fertility and stimulate egg production
84	c) They help stimulate the release of multiple eggs
85	c) Fertilization of an egg outside the body, followed by embryo implantation
86	c) Social, ethical, and procedural implications
87	b) In a laboratory dish
88	c) The impact on family dynamics and relationships