B3 – Homeostasis Quiz

1. Which organ in the body monitors the concentration of glucose (sugar) in the blood?

   Pancreas

2. Describe, as fully as you can, what happens to amino acids that cannot be stored in the body.

   They are broken down and converted to urea inside the liver; urea is then filtered out by the kidneys and stored in urine in the bladder.

3. Describe the role of blood vessels in the control of body temperature.

   If body temperature too high blood vessels supplying skin (capillaries) dilate / widen; if body temperature is too low blood vessels supplying skin (capillaries) constrict / narrow; so more / less blood flows through skin (capillaries) or nearer the surface of the skin; so more / less heat is lost (from the skin by radiation)

4. Suggest why an athlete overheats in humid conditions when the temperature is above 18oC.

   The sweat released cannot evaporate in humid conditions so less heat is lost from the athlete's body.

5. Explain why a man's urine contains a higher concentration of mineral ions and urea on a hot day than on a cold day.

   Because more sweating occurs on a hot day more water is lost as sweat. The kidney will reabsorb more water and the volume of water in urine will be lower.

6. Name two substances found in the urine of a healthy person.

   Urea, ions, water

7. Describe what happens to glucose in the blood of a healthy person when the blood enters the kidney.

   The glucose is filtered (into kidney tubule) and then all is reabsorbed into the blood.

8. Explain why the urine of a diabetic person may contain glucose.

   Not all glucose reabsorbed because the concentration in the tubule is too high.

9. What process brings about shivering?

   Muscle contraction

10. Explain how shivering increases body temperature.

    Respiration releases heat.

11. Explain why protein is not found in the urine of a healthy person.

    Proteins are too large to fit through the pores in the filter inside the kidneys.

12. Which part of the brain monitors the fall in core body temperature?

    Thermoregulatory centre/hypothalamus

13. How does this the thermoregulatory centre inside the brain detect the fall in core body temperature?

    It has receptors that monitor blood temperature.

14. Explain why someone who has been drinking alcohol is more likely to die of hypothermia.

    The blood vessels are more dilated so more blood is closer to the surface and more heat is lost

15. Explain how dialysis treatment restores the concentrations of dissolved substances in the blood to normal levels.

    The dialysis fluid contains the ideal concentration of glucose and mineral ions. Waste passed through a partially permeable membrane out of the blood by diffusion along the concentration gradient.

16. Describe the parts played by the brain and the skin in monitoring body temperature

    The thermoregulatory centre monitors blood temperature; the skin contains receptors and sends impulses to the thermoregulatory centre.

17. Explain why the amount of insulin injected by diabetics needs to be carefully controlled.

    Too much insulin leads to too low blood sugar, too little leads to too much blood sugar/ diet varies/ too much or too little might lead to coma

18. What features of blood make someone's blood type group O?

    No antigens on the surface of red blood cells.

19. Describe three different ways by which most mammals are able to maintain a constant body temperature when the temperature of the environment falls.

    Hair/Fur stands on ends to increase insulation; blood vessels constrict so less blood is near the surface and less heat is lost; shivering to generate heat

20. Where is insulin produced?

    Pancreas

21. Explain the role of insulin in controlling blood sugar levels.

    It lowers blood sugar levels by converting glucose to glycogen in the liver; it also increases the uptake of glucose by body cells.

22. What is the job of the circulatory system?

    To transport blood and other substances around the body.

23. Explain, using insulin as an example, what is meant by negative feedback.

    Higher blood sugar level results in increased secretion of insulin; effect of insulin is to lower blood sugar which in turn reduces rate of insulin secretion; overall result is to keep fluctuations in sugar level to a minimum.

24. Explain why the concentration of urea in the liquid in the bladder is much greater than the concentration of urea in the liquid that is filtered in the kidneys.

    Most water is reabsorbed, unlike urea.

25. Explain, as fully as you can, why respiration has to take place more rapidly during exercise.

    More energy is needed for increased muscular activity.

26. Explain fully what would happen if somebody ate some glucose tablets.

    Glucose level rises, pancreas releases insulin, glucose is converted to glycogen in the liver, glucose levels return to normal