**B7: Further Biology**

Revision questions

**7.1 Peak performance – movement and exercise**

1. What is the purpose of an internal skeleton?
2. What are antagonistic muscle pairs? Why do muscles need to be antagonistic?
3. Can you draw the following on a joint and state their function:
   1. Cartilage
   2. Synovial fluid
   3. Ligaments
   4. Tendons
4. Why do doctors want to know your medical and lifestyle history before an exercise regime is started?
5. How would you expect heart rate and blood pressure to change during exercise?
6. What is BMI? How is it calculated?
7. Why is accuracy of equipment important when you are monitoring the progress of an exercise regime?
8. What happens during the following injuries?
   1. Sprain
   2. Dislocation
   3. Torn ligament/tendon.
9. What is the procedure for treating a sprain?
10. What is a physiotherapist and how do they treat skeletal-muscular injuries?

**7.2 Peak Performance – circulation**

1. What is meant by a double circulatory system?
2. What substances get transported in the blood to and from muscles?
3. What are the four components of blood and what are their functions?
4. How is a red blood cell adapted to its function?
5. Can you label the four chambers of the heart and the blood vessels that enter and leave them?
6. What is the function of valves?
7. What is tissue fluid? How is it formed and what function does it have?

**7.3 Peak Performance – energy balance**

1. To maintain a constant body temperature what must heat gain equal?
2. Where are the receptors in the body that detect external temperature found?
3. Where are the receptors in the body that detect blood temperature?
4. The hypothalamus acts as a ‘processing centre’. What does this mean?
5. What are the effectors in temperature regulation?
6. Why does sweat cool you down?
7. What is vasodilation and vasoconstriction and how do these affect your temperature?
8. Why does shivering warm you up?
9. Give an example of antagonistic action in temperature control.
10. What type of food gives a rapid rise in blood sugar levels?
11. What are the two types of diabetes? Describe what causes each type.
12. How are the two types of diabetes controlled?
13. What are complex carbohydrates and why is a diet containing these better for controlling blood sugar levels?
14. Name four illnesses/ diseases that can be caused by an unhealthy lifestyle.

**7.4 What can we learn from ecosystems?**

1. What is a closed loop system?
2. What waste products are produced in natural ecosystems?
3. What happens to the waste products formed in natural ecosystems?
4. Why are ecosystems not an example of a perfect closed loop system?
5. Use rainforests to show how in a stable ecosystem loses are balanced by gains.
6. Why is the production of lots of reproductive structures (such as pollen and sperm) not wasteful?
7. How does vegetation in rainforests prevent soil erosion?
8. What benefits do humans get from natural ecosystems?
9. Why are human systems not closed loop systems?
10. What is bioaccumulation? What are its effects?
11. What is eutrophication? How does it occur?
12. How does excessive removal of timber and overfishing affect those ecosystems?
13. How is biodiversity affected when trees are cut down to establish agriculture?
14. Name two sustainable solutions to overfishing and overharvesting of trees.
15. What is sustainability? How can humans be sustainable in their exploitation of ecosystems?
16. How does crude oil form?
17. Why can crude oil be described as ‘fossilised sunlight energy’?
18. Why is sunlight a sustainable source of energy in natural ecosystems and sustainable agriculture?
19. Why might there be tension between people who want to conserve natural ecosystems and local human communities?

**7.5 New technologies**

1. List five features that make bacteria ideal for industrial and genetic processes.
2. How are bacteria and fungi used to produce:
   1. Antibiotics?
   2. Single-cell protein (e.g. Quorn)?
   3. Enzymes for cheese?
   4. Biological washing powders?
   5. Biofuels?
3. What is genetic modification? List the four steps of genetically modifying a bacterium to make it produce insulin.
4. How is genetic modification used to produce herbicide resistant crops?
5. What is a labelled gene probe? Describe how it is made and how it is used to identify specific alleles in a DNA sample.
6. What is nanotechnology? Give one example of how it can be used in the food industry.
7. How can stem cell technology be used to treat:
   1. Leukaemia?
   2. Spinal cord injuries?
8. How does a heart pacemaker work?
9. Why do some people need replacement heart valves? What problems can these replacement valves cause?