

MODULE 5

1. Where does external fertilisation occur?
2. Is self-pollination a form of asexual reproduction?
3. Does external fertilisation require the release of more gametes?
4. By what processes do fungi reproduce?
5. Can fungi undergo sexual reproduction?
6. Which classes of organisms undergo binary fission?
7. What process/es do protists use to reproduce?
8. What is fertilisation?
9. Give one example of internal fertilisation.
10. Give one example of external fertilisation.
11. State one advantage of internal fertilisation.
12. State one disadvantage of external fertilisation.
13. Which hormone starts the menstrual cycle?
14. Which hormones spike before ovulation?
15. State one function of progesterone.
16. State one function of oestrogen during pregnancy.
17. How many cells result at the end of mitosis?
18. How many cells result at the end of meiosis?
19. In which phase(s) of meiosis do genetic material condense?
20. In which phase(s) of mitosis are chromosomes pulled apart?
21. What processes contribute to genetic variation in meiosis?
22. What are the main roles of mitosis in the continuity of a species?
23. What is the composition of a nucleotide?

24. What is the complementary base for adenine?
25. What is the complementary base for cytosine?
26. What type of bonding holds bases together in DNA?
27. How many bonds are between adenine and its complementary base?
28. What are the two processes involved in polypeptide synthesis?
29. Give two differences between eukaryotic and prokaryotic DNA.
30. Which DNA base is replaced in RNA, and by what?
31. What is the main role of mRNA?
32. Which part of tRNA binds to mRNA?
33. What is the main enzyme involved in polypeptide synthesis?
34. In what direction does transcription occur?
35. What is the template strand?
36. Where in the cell does transcription occur?
37. Where in the cell does translation occur?
38. What are the four levels of protein structure?
39. Give an example of a protein with the most complex structure.
40. What are autosomal chromosomes?
41. If a trait is X-linked, how many copies of the allele does a male need to express the disease?
42. Define co-dominance.
43. Define incomplete dominance.
44. Give an example of multiple allele inheritance.
45. What is a single-nucleotide polymorphism (SNP)?
46. What does PCR stand for?
47. How does gel electrophoresis separate DNA?

48. What is the difference between DNA sequencing and DNA profiling?

49. Name one type of DNA sequencing.

50. Name 3 enzymes involved in DNA replication and their role.



MODULE 6

1. Define the term mutagen.
2. Name one electromagnetic radiation source that is a mutagen.
3. Name one chemical mutagen.
4. Name one naturally occurring biological mutagen.
5. Name one naturally occurring non-biological mutagen?
6. What is a mutation called when the same amino acid is produced?
7. What is a mutation called when a different amino acid is produced?
8. What is a mutation called when a stop codon is produced?
9. How does a mutation in mRNA change the protein produced?
10. Define point mutation.
11. List the different types of point mutations.
12. List the different types of chromosomal mutations (not aneuploidy).
13. Define somatic cells.
14. How many chromosomes do human somatic cells have?
15. How many chromosomes do human germ-line cells have?
16. Distinguish between germ-line and somatic mutations.*
17. State the importance of coding DNA.
18. State the importance of non-coding DNA.
19. What is non-coding DNA called?
20. What is coding DNA called?
21. Identify the three main sources of genetic variation.
22. Define gene flow.
23. Define genetic drift.
24. Name one biotechnology used in animals.
25. Name one biotechnology used in plants.
26. Define biotechnology.
27. Outline two benefits of one biotechnology you named.

28. Describe one way a biotechnology you named affects biodiversity.
29. Define artificial insemination.
30. Define artificial pollination.
31. Distinguish between whole-organism cloning and gene cloning.
32. Name the two main enzymes used in recombinant DNA technology.
33. Name one application of recombinant DNA technology.
34. Define transgenic organism.
35. Name a transgenic organism used in agriculture.
36. Name a transgenic organism used in medicine.
37. State one similarity between gene cloning and whole-organism cloning.
38. Explain why cloned organisms often have shorter life spans.
39. For a named transgenic organism, how does it differ from its wild type?
40. Does artificial insemination increase biodiversity in the long term? Justify briefly.
41. Name one ethical implication of biotechnology.
42. Name one social implication of biotechnology.
43. Name one economic implication of biotechnology.
44. Name one cultural implication of biotechnology.
45. What is a frameshift mutation?
46. How does mutation introduce new alleles into a population?
47. What is the role of a plasmid in recombinant DNA technology?
48. Name one industrial application of genetic technology.
49. Name one future direction of biotechnology.
50. How does growing genetically uniform crops affect biodiversity?

MODULE 7

1. Name one cellular pathogen.
2. Name one prokaryotic pathogen.
3. Name one pathogen that is macroscopic.
4. Name one eukaryotic pathogen.
5. Name one infectious disease caused by bacteria.
6. Name one infectious disease caused by fungi.
7. Name one infectious disease caused by protozoa.
8. Name one infectious disease caused by a virus (not COVID-19).
9. Name one infectious disease caused by a macroparasite.
10. Name one infectious disease caused by a prion.
11. Whose postulates are used to determine whether a disease is infectious?
12. What type of transmission is this: coughing onto someone?
13. What type of transmission is this: being bitten by a dog?
14. What type of transmission is this: touching an infected surface?
15. Which theory did Pasteur disprove?
16. Describe the experiment Pasteur used to disprove it.
17. Name one plant disease.
18. Identify the pathogen that causes the plant disease you named.
19. Outline the plant's defences against that pathogen.
20. Name one component of the first line of defence.
21. Name two components of the second line of defence.
22. Name the two main cell types in the third line of defence.
23. Name the two main cell types involved in innate immunity.
24. State one difference between adaptive and innate immunity (without using the names).
25. List some ways to prevent the spread of disease.
26. Name one disadvantage of antibiotics.
27. Name one advantage of antibiotics.

28. Name one disadvantage of antivirals.
29. Name one advantage of antivirals.
30. List the four types of T cells.
31. Which cell produces antibodies?
32. Define antigen.
33. Outline the main features of inflammation.
34. Define vaccine.
35. Name all the cells that interact with a vaccine to create immunity.
36. Define passive immunity.
37. Is breastfeeding active or passive immunity?
38. Give one example of natural active immunity.
39. Identify the pathogen and the vector that cause malaria.
40. How do viruses stay undetected by the immune system?
41. State the function of antibodies.
42. Which antigen-presenting molecule is important to adaptive immunity?
43. Which chemicals do leukocytes use to communicate with each other?
44. Describe one way bacteria evade the host immune system.
45. Outline how viruses replicate.
46. Name one Aboriginal medicine.
47. Explain how the environment affects infectious disease.
48. Define vector in the context of disease transmission.
49. State the role of memory cells in immunity.
50. What is herd immunity?

MODULE 8

1. Define homeostasis.
2. What is the difference between negative feedback and positive feedback?
3. What is the control centre responsible for regulating body temperature?
4. Name three effectors involved when body temperature rises.
5. Name three effectors involved when body temperature falls.
6. When is glycogen broken down into glucose?
7. When is glycogen formed and stored?
8. Where is glycogen primarily stored in the body?
9. Which cells secrete insulin, and which organ are these cells found in?
10. State the function of insulin in regulating blood glucose levels.
11. Does blood glucose concentration immediately increase after eating? Explain why or why not.
12. State two differences between the endocrine system and the nervous system.
13. What is the threshold voltage required to trigger an action potential in a typical neuron?
14. What is the name of the stage of an action potential when the membrane potential reaches its peak and begins returning towards a negative voltage?
15. Name two physiological mechanisms plants use to maintain water balance.
16. Define physiological adaptations.
17. Define structural adaptations.
18. Define behavioural adaptations.
19. Give one example each of a physiological, structural and behavioural adaptation.
20. Give one example of a genetic disease.
21. Give one example of a disease caused by environmental exposure.
22. Give one example of a nutritional disease.
23. Give one example of a specific type of cancer.
24. Distinguish between disease prevalence and disease incidence.
25. State the differences between case-control studies and cohort studies.
26. Outline some ways of preventing non-infectious diseases, giving examples.

27. Which structures of the ear are affected in sensorineural hearing loss?
28. State one physiological cause of myopia.
29. Distinguish between myopia and hyperopia.
30. Name one treatment for kidney disease.
31. For which type of hearing loss are hearing aids commonly prescribed?
32. What type of disease is caused by changes in DNA?
33. What type of disease can be caused by exposure to UV radiation?
34. What type of disease results from a deficiency or excess of nutrients?
35. Which disease involves uncontrolled cell division?
36. Which disease involves clouding of the lens of the eye?
37. Draw a diagram showing the direction of flow of blood and dialysate solution in haemodialysis.
38. What type of lens is used to correct myopia?
39. In hyperopia, does the focal image land in front of or behind the retina?
40. When would bone conduction implants be prescribed instead of cochlear implants?
41. Outline the negative feedback loop that returns blood glucose to normal after a meal.
42. Why are epidemiological studies used?
43. Describe one benefit of engaging in an epidemiological study, using an example.
44. Identify one strength or one limitation of the method used in an epidemiological study you have studied.
45. For a non-infectious disease you have studied, outline one possible future direction for research.
46. Name one educational program or campaign used to prevent a non-infectious disease.
47. How can genetic engineering be used to help prevent a non-infectious disease?
48. How does a cochlear implant assist a person with sensorineural hearing loss?
49. How does laser surgery correct a visual disorder?
50. Evaluate the effectiveness of one technology used to manage a disorder