

I. DNA Cloning

\*364-371

- 3.4.9 State that genetic material can be transferred between species because the genetic code is universal. 1.
- 3.4.10 Outline a basic technique used for gene transfer involving plasmids, a host cell (bacterium, yeast or other cell), restriction enzymes (endonuclease) and DNA ligase. 2
- 3.4.11 State two examples of the current uses of genetically modified crops or animals. 1.
- 3.4.12 Discuss the potential benefits and possible harmful effects of one example of genetic modification. 3
- 3.4.13 Outline the process of gene therapy using a named example. 2
- 3.4.14 Define clone. 1
- 3.4.15 Outline a technique for cloning using differentiated cells 2
- 3.4.16 Discuss the ethical issues of cloning in humans. 3
- ➔ Recombinant DNA, restriction enzymes, sticky end, cloning vector, genomic library
- ➔ What are some current recombinant technologies?

II. PCR and Electrophoresis

\*371-378

- 3.4.1 State that PCR (polymerase chain reaction) copies and amplifies minute quantities of nucleic acid. 1
- 3.4.2 State that gel electrophoresis involves the separation of fragmented pieces of DNA according to their charge and size. 1
- ➔ PCR, gel electrophoresis, RFLP

III. Applications

\*379-385

- 3.4.3 State that gel electrophoresis of DNA is used in DNA profiling. 1
- 3.4.4 Describe two applications of DNA profiling. 2
- 3.4.5 Define genetic screening. 1
- 3.4.6 Discuss three advantages and/or disadvantages of genetic screening. 3
- 3.4.7 State that the Human Genome Project is an international cooperative venture established to sequence the complete human genome. 1
- 3.4.8 Describe two possible advantageous outcomes of this project. 2
- ➔ HGP, mapping, sequencing, DNA fingerprinting, transgenic
- ➔ What are some practical applications of nucleic acid technology?
- ➔ What legal and ethical problems may arise from these applications?

IV. Bacterial and Viral Genetics

A. Viruses – What are they?

\*319-328

- 1.1.2 State that a virus is a non-cellular structure consisting of DNA or RNA surrounded by a protein coat. 1
- Phage, lytic cycle, lysogenic, retrovirus
- 6.3.6 State that reverse transcriptase catalyses the production of DNA from RNA. 1
- 6.3.7 Explain how reverse transcriptase is used in molecular biology. 3
- \*you do not need to know many details here

B. Bacteria

\*330-336

Transformation, transduction, conjugation, R plasmids, antibiotic resistance