Marks

Question 30 — Genetics – The Code Broken? (25 marks)

(a) (i) State ONE difference between a haploid cell and a diploid cell from the same species. **1**

(ii) Define the term *linkage* with reference to genes. **1**

(iii) Explain how linkage can be used to map chromosomes. **3**

(b) During your study of this option, you were required to construct a model of DNA.

(i) Describe the model you constructed. **3**

(ii) Justify the design of your model. **3**

(c) The data in the table shows the results of measuring the heights of 1000 adult humans.

Height group (m)	Number of individuals in group
1.60–1.64	58
1.65–1.69	92
1.70–1.74	178
1.75–1.79	322
1.80–1.84	190
1.85–1.89	110
1.90–1.94	50
1.95–1.99	0

(i) Graph the data on the graph paper provided on page 33. **4**

(ii) Define what is meant by *polygenic inheritance*. **1**

(iii) How does the pattern of polygenic inheritance of height in humans compare with the pattern of inheritance discovered by Gregor Mendel in his research on pea plants? **2**

(d) Selective breeding is different to gene cloning but both processes may change the genetic nature of species. **7**

Using appropriate examples, explain the above statement.