1. Match each description or example (letter list) in the right-hand column to the best term in the left-hand column (number list). Use only one description per term and one term per description.

	Term	Description/Example
1.	progenitor cell	a. related gene expression effects
2.	diseasome	b. aneuploidy
3.	cell adhesion	c. equational division
4.	homologue	d. pluripotent
5.	secondary spermatocyte	e. contact inhibition
6.	nondisjunction	f. euchromatin
7.	exome	g. differentiation
8.	homeobox	h. bivalent

(**8 marks**)

2. Choose two diseases* (a general or specific name), each involving a different one of the following cellular components: lysosomes, membranes, or the cytoskeleton. Use only the information in the Lewis text to describe whether the protein for each disease is structural, an enzyme, for transport, for communication, or has other functions, and to answer one or more of these points:

- name the related protein.
- note whether the related protein is abnormal or missing.
- describe an example of an action or consequence of the defect.

(**4 marks**)

*Note that diseases themselves are used here as examples of genetic concepts.

3. An individual is suspected of being a carrier of a paracentric inversion. Describe how this inversion could be detected by chromosomal staining, and by FISH.

(**3 marks**)

4. Lewis describes a situation of uniparental disomy where “two identical copies of the chromosome” (Lewis 259) were in the oocyte. Why can’t these chromosomes be completely identical?

(**2 marks**)

5. A family has a child affected with trisomy 18. A trait related to a gene on chromosome 18 has been studied in the family. The parents have normal phenotypes for this trait. It has been determined that the mother produces only

normal protein for this trait, and the father produces equal amounts of its normal and abnormal forms. The child with trisomy 18 has twice as much abnormal as normal form of this protein. The gene for this protein is very close to heterochromatic DNA of the centromere, thus reducing its crossing-over frequency. Which parent contributed the extra chromosome to the child? Explain. In which division did the error most likely occur? Explain.

(**4 marks**)