**B1 Rev Pack 2 markschemeM1.**          (a)     chromosomes

**1**

(b)     diagram showing four separate chromosomes two long and two short  
(as in diagram 1)

*allow each chromosome shown as two joined chromatids  
do* ***not*** *allow if chromosomes touching each other*

**1**

(c)     (i)      any **two** from:

•        can grow into any type of tissue / named tissue

•        used in medical research

•        used to treat human diseases

•        large numbers can be grown

**2**

(ii)     any **two** from:

•        expensive

•        grow out of control / ref cancers

•        may be rejected

•        need for drugs (for rest of life)

**2**

**[6]**

**M2.**         (a)      (i)     mitosis

*correct spelling only*

**1**

(ii)     replicates / doubles / is copied / duplicates

*accept cloned  
ignore multiplied / reproduced*

**1**

(b)     fertilisation occurs / fusion (of gametes)

*accept converse for asexual, eg none in asexual / just division in asexual*

**1**

so leading to mixing of genetic information / genes / DNA / chromosomes

*genes / DNA / chromosomes / genetic information comes from 1 parent in asexual  
ignore characteristics*

**1**

one copy (of each allele / gene / chromosome) from each parent  
**or**gametes produced by meiosis  
**or**meiosis causes variation

*meiosis must be spelt correctly*

**1**

**[5]**

**M3.**          (a)     23

**1**

(b)     chromosome     nucleus      gene     cell

2                    3             1          4

**1**

(c)     (i)      any **one** from

(cells which are bigger) take up more space

(cells) have to get bigger **or** mature to divide

**1**

(ii)     chromosomes duplicate **or**make exact copies of self

*accept forms pairs of chromatids*

**1**

nuclei divide

*accept chromatids* ***or****chromosomes separate*

**1**

identical (daughter) cells formed

*accept for example, skin cells make  
more skin cells* ***or*** *cells are clones*

**1**

(d)     any **two** from

*Differentiation mark*babies need **or** are made of different types of cells **or** cells that have  
different functions

*accept different cells are needed  
for different organs*

*Division or specialisation mark*as fertilised egg starts to divide each cell specialises to form a part of the body

*accept specialised cells make  
different parts of the body*

*Growth mark*specialised cells undergo mitosis to grow further cells

*accept cells divide* ***or*** *reproduce  
to form identical cells*

**2**

**[8]**

**M5.**          (a)                 comparisons are **not** required but should be credited  
            accept a clear indication of the statement even if incomplete

can develop into most other types of cell

**1**

each cell divides every 30 minutes

**1**

low chance of rejection by the patient’s immune system

**1**

(b)     any **three** from:

•        cheaper / only costs £1000

*this* ***must*** *be comparative*

*ignore costs £1000*

•        can collect many (stem) cells

•        adults give permission for their own bone marrow to be collected

*comparisons are not required but should be credited*

•        safe

**3**

**[6]**

**M6.**          any **four** from:

•        cells used to treat diseases do not go on to produce a baby

•        produces identical cells for research

•        cells would not be rejected

•        allow cells can form different types of cells

•        (immature) egg contains only genetic information / DNA /  
genes / chromosomes from mother **or** there is only one parent

•        asexual / no mixing of genetic material / no sperm involved /  
no fertilisation **or** chemical causes development

•        baby is a clone

•        reference to ethical / moral / religious issues

*allow ethically wrong****NB*** *cloning is illegal gains* ***2*** *marks  
ignore unnatural*

•        risk of damage to the baby

*in correct context*

**[4]**