

Name of the Student: \_\_\_\_\_

Max. Marks : 20 Marks

Time : 20 Minutes

Mark Schemes

Q1.

- (a) (i) DNA replication / copies of genetic material were made  
*'it' = a chromosome*  
*allow chromosomes replicate / duplicate / are copied*  
*ignore chromosomes divide / split / double* 1
- (ii) one copy of each (chromosome / chromatid / strand) to each offspring cell  
*ignore ref. to gametes and fertilisation* 1
- each offspring cell receives a complete set of / the same genetic material  
*allow 'so offspring (cells) are identical'* 1
- (b) (i) meiosis  
*allow mieosis as the only alternative spelling* 1
- (ii) Species A = 4 **and** Species B = 8 1
- (iii) sum of A + B from (b)(ii) e.g. 12 1
- (c) (i) similarities between chromosomes  
**or**  
similarities between flowers described  
*e.g. shape of petals / pattern on petals / colour / stamens* 1
- can breed / can sexually reproduce  
*allow can reproduce with each other / they can produce offspring* 1
- (ii) any **two** from:
- offspring contain 3 copies of each gene / of each chromosome / odd number of each of the chromosomes
  - some chromosomes unable to pair (in meiosis)
  - (viable) gametes not formed / some gametes with extra / too many genes / chromosomes

**or**  
some gametes with missing genes / chromosomes

2

**[10]**

Q2.

(a) oxygen / O<sub>2</sub>

*allow O<sub>2</sub>*

*do not accept O<sup>2</sup>*

**or**

carbon dioxide / CO<sub>2</sub>

*allow CO<sub>2</sub>*

*do not accept CO<sup>2</sup>*

1

(b) any **four** from:

*ignore references to tail used for locomotion*

*ignore reference to nostrils*

- because structure X / gills has threads / filaments **or** is thin **or** tadpole has longer tail
- there is an increased surface area
- there is a shorter diffusion pathway
- therefore an increase in exchange  
*ignore food*
- eyes (now visible in older tadpole)
- so that food / danger etc can be seen  
*accept reference to a good blood supply*  
*accept increased water flow over gills / tail will increase diffusion of gases*

4

[5]

Q3.

- (a) water enters (funnel / sugar solution) **or** water diffuses in (to the funnel)  
*do **not** accept if diffusion of sugar*

1

membrane partially / selectively / semi permeable **or** by osmosis  
*allow description*

1

because concentration (of sugar) greater  
inside funnel than outside / water / in beaker  
*assume 'concentration' refers to sugar unless candidate indicates  
otherwise  
the position of the solutions may be implied*

1

- (b) (level / it) rises more slowly **or** levels out earlier **or** does not rise as much  
*accept inference of less steep gradient (of graph)  
allow less / slower osmosis / diffusion / less water passes through or  
less water enters funnel  
allow water enters / passes through slower*

1

less difference in concentration (between solution / funnel and water / beaker)  
*accept due to lower diffusion / concentration gradient / described*

1

[5]