**Review Worksheet Answers – Primate Evolutionary Trends**

1: What animals are included in the Primate Order?
(3 – 0.5 marks each for six examples)

*Humans, Great Apes, Gibbons, Monkeys, Lemurs, Lorises, Tarsiers*

2: To which family to Humans and Great Apes belong?
(1 mark)

*Hominidae*

3: Which other living primate shares the subfamily *Homininae* with humans?
(1 mark)

*Chimps*

4: What are the main features of primate digits?
(4 marks)

- *Pentadactyl (0.5) - 5 on each limb (0.5)*
- *highly mobile (1)*
- *prehensile (0.5) - can curve around things to grip (0.5)*
- *opposable thumbs (0.5) thumb can cross palm to touch other fingers (0.5)*

5: Most primates have an opposable big toe. Humans are the exception. What is different about humans that would make having an opposable big toe a disadvantage?

*Bipedalism (0.5) – walking upright (0.5). Having an opposable big toe would mean the feet have less stability (0.5) and uneven weight distribution (0.5).*

6: How many teeth do Humans, Apes and Old World Monkeys have? What is their dental formula?
(2 marks)

*32 teeth (1), formula: 2:1:2:3 (1)*

7: What is the most likely reason for the reduction in number of teeth in primates compared to early mammals?
(2 marks)

*Primates have a trend towards reduction in face and jaw size(1), meaning less room for teeth (1).*

8: How many cusps can be seen on the molar teeth of apes and humans, and how does this compare to other primates?
(2 marks)

*Apes and humans have 5 cusps on each molar (1), whereas other primates have fewer (1).*

9: What is the advantage to arboreal primates of having an emphasis on vision?
(2 marks)

*An emphasis on vision allows better depth perception (1) so that distance and location of branches can be accurately judged when jumping (1).*

10: What changes to the skull, eye and brain occurred to accommodate the emphasis on vision? (5 marks)

- *Smaller, flatter nose and snout*
- *Larger brain case*
- *Movement of eyes to face forward*
- *Rods and Cones in retina*
- *Better neural connections between eye and brain*

11: What is the function of the cerebral cortex and what trend can be seen in the cerebral cortex from lemurs to monkeys to apes to humans?
(3 marks)

*The cerebral cortex is involved in reasoning, memory, manipulation and construction, vision and language. (1 mark)*
*The trend that can be seen between lemurs and humans is that cerebral cortex siize increases (1) and number of convolutions increases (1)*

12: How are cerebral cortex size and the need for high parental care over a long period linked?
(4 marks)

*Increased cerebral cortex size means a larger skull is needed (1). This means young have to be born at an earlier stage of development (1) so that the head of the foetus can fit through the pelvic canal during birth (1). This means the young will have to be cared for by the parent until they become independent (1).*

13: Gene mutations occur via base deletion, substitution or insertion. For each, list one genetic disease that is caused in this way.

A: Disease caused by base deletion: *Duchenne Muscular Dystrophy / Cystic Fibrosis*

B: Disease caused by base substitution: *Sickle Cell Anaemia*

C: Disease caused by base insertion: *Beta-Thalassemia*