

WJEC (Wales) Biology A-level
Topic 2.1: Biodiversity
Questions by Topic - Mark Scheme

1.

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
1	(a)			raccoon (1) There is only 1 base difference between red panda and racoon/more bases in common between red panda and racoon/ there are more differences between red panda and giant panda and black bear(1)		2		2		
	(b)			17 differences/ 3.95×10^{-7} = 43037974.68 1 mark = 43 000 000 2 marks = 4.3×10^7 years 3 marks		3		3	3	
	(c)			Analogous structures (evolve separately) are different structures to perform a similar function/or example (1) Homologous structures (evolve from a common ancestor) similar structure performing different functions/or example (1) Analogous structures arise through convergent evolution/OWTTE (1)	3			3		
	(d)			Eukaryota (1) Contains membrane bound organelles/DNA bound in nuclear envelope/80S ribosomes/multicellular (1)	1	1		2		
				Question 1 total	4	6	0	10	3	0

2. Fungi;

Animalia / animal;

Protoctista; Accept Protists;

Prokaryotae / Monera; NOT bacteria;

Plantae/plant;

Question total 5

3.

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)			Phylogenetic tree/Evolutionary tree/phylogenetic (1) Accept Cladogram NOT Family tree/pedigree diagram	1			1		
	(b)	(i)		Diagram B (1) Hippo closest relative/shares most recent common ancestor with the hippo (1) Fewest differences/most similarities/or use of data (1)		1	2	3		
		(ii)		Classification {may change/not fixed/not permanent} (1) As more {information/knowledge/techniques} becomes available/OWTTE (1)	2			2		
	(c)			Family (1)	1			1		
	(d)	(i)		Increase from Antarctic circle to the tropics (1) Accept as latitude decreases numbers increase Reject references to latitude increasing Reject reference to Arctic levels off/slight decrease in the tropics (1)		2		2		
		(ii)		Temperature/food availability (1)		1		1		
		(iii)		Two peaks/OWTTE (1) Accept two modes		1		1	1	
				Question 3 total	4	5	2	11	1	

4.

- (a) Prokaryotae , any of the bacterial diseases.
 Protoctista , Malaria Accept others if correct
 Fungi , Athletes foot, ringworm, thrush etc. [3]
- (b) (i) Humans, chimps, gorilla, orang-utans. [1]
 (ii) $\frac{1.6}{0.7} = 2.28$, 2.28×3 ;
 6.84 million years; [2]
 (iii) Proteins accept enzymes. [1]
- (c) Could not interbreed;
 To produce fertile offspring. [2]

Total 9 marks

5.

Question		Marking details	Marks Available
5	(a)	Biodiversity	1
	(b)	(tropical) rain forest; coral reef;	2
	(c)	{the higher the latitude / the further from the equator} the lower the number of species / ORA;	1
	(d)	Very {little water / rainfall} / ref temperature; A {low variety of / not enough different} {plants for them to feed on / types of food};	2
Question 5 Total			[6]

6. D;
E;
B;
A;
C; (Total 4 marks)

(four marks for all five, three for four, two for three and one for two)

7. (a) Prokaryotae; Fungi; Plantae [3]
- (b) Class - mammalia
Family – Hominidae [2]
- (c) Not able to interbreed; to produce fertile offspring [2]
- (d) DNA hybridisation/Genetic or DNA fingerprinting / (gel) electrophoresis
(**not:** DNA profiling) [1]

[Total 8 marks]

8

Characteristic	Plant;	Animal; Accept animalia	Prokaryote; Accept prokaryotic	Protoctista; NOT protozoa/ fungi
Eukaryotic	✓	✓	✗	✓
Chloroplast	✓	✗	✗	Some species
Cell wall	✓	✗	✓	Some species
Nucleus	✓	✓	✗	✓

4

Question 8 total

[4]

9.

Question		Marking details	Marks Available	
9.	(a)	(i) One mark for each correct column	2	
		Kingdom		Animalia
		Phylum		Chordata
		Class		Mammalia
		Order		Carnivora
		Family	Felidae	
		Genus	<i>Panthera</i>	
		Species	<i>uncia</i>	
		(ii) Possess a backbone / spine / internal skeleton / (well developed) CNS / brain within a cranium;	1	
	(b)	(i) Lion and jaguar/ <i>Panthera leo</i> and <i>Panthera onca</i> ;	1	
		(ii) They would have <u>more / most</u> {bands / sequences} in {common / similar} (compared to other species); NOT amino acids	1	
Question 9 total			[5]	

10.

Question			Marking details	Marks Available
10	(a)		Mammalia/ mammals/ mammalian;	1
	(b)		a group of organisms (with similar characteristics) that can <u>interbreed</u> ; NOT breed alone/ reproduce and produce <u>fertile</u> offspring;	2
	(c)	(i)	reference to <u>shape of skull/jaw/cranium/ teeth</u> being similar (allow converse for Gorilla);	1
		(ii)	<i>Homo erectus</i> ; (<i>erectus</i> and <i>sapiens</i>) share same genus; allow converse	2
			Question 10 total	[6]

11.

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
11	(a)	(i)	Any two for 1 mark from Have nucleus (1) membrane-bound organelles/ named example(1) 80S ribosomes (1) DNA associated in chromosomes/linear (1)	1			1		
		(ii)	Absence of protein/S layer in Gram negative (1) layer of (lipoproteins/lipopolysaccharides) (1)	1	1		2		
			Question 2 total	2	1	0	3	0	0