

Biology 1001 Final Exam

Answer Key

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Question	Answer	Explanation
1	B	Although all options are true aspects about Viruses, only option B provides support to the theory that viruses are considered alive.
2	B	Reverse transcriptase is an enzyme found in retroviruses, which are a type of RNA virus. The central dogma of molecular biology describes the flow of genetic information in cells: DNA is transcribed into RNA, and RNA is translated into proteins. However, reverse transcriptase allows retroviruses to reverse this process. Retroviruses, like HIV, have an RNA genome. When they infect a host cell, they use a reverse transcriptase to convert their RNA genome into DNA.
3	D	D correctly applied natural selection. Natural selection states that Individuals with traits that allow them to survive better and leave more offspring (higher fitness) that inherit these traits are favoured. In option D, the blue birds have survival advantages making them favoured. In options A,B, and C it is not explicit that the socialisation, stronger immunity, and fruits had a connection with providing a survival advantage.
4	C	Clinal variation refers to the observable differences in morphology and genetics among populations as they adapt to diverse environmental conditions, such as varying elevations. Despite these differences, all populations exhibiting clinal variation are considered part of the same species because they share alleles across the entire range
5	B	Homoplasies refer to similar traits that have evolved independently and do not share a common ancestry.
6	B	Secondary contact occurs when populations that were previously geographically separated come into contact with each other again
7	D	As long as the birth rate (including immigration) is greater than the death rate, populations continue to grow exponentially. However, over time, the availability and accessibility of resources eventually become constrained or more challenging to acquire.
8	D	Mutualism is a type of species interaction where both participating species benefit from their association with each other. In the scenario described, the cleaner bird gains access to a reliable food source (ticks and parasites) by cleaning the deer's fur, while the deer benefit by having harmful parasites removed, which improves their health and overall well-being.
9	C	One Health Concept connects the well being of people, animals, and the environment through collaborative problem-solving, locally, nationally, and globally

10	D	Mating assortatively means that the population is inbreeding and thus, will favour homozygotes. Therefore, the answer is D because it is the only population which homozygotes are favoured.
11	A	
12	B	
13	D	
14	E	The monophyletic groups are (A & B), (A, B, C), (A, B, C, D), (E & F), (D, E, F), (C, D, E,F), and (A, B, C, D, E, F).
15	B	Species B would be the outgroup as it has the most differences (most distant ancestor)
16	C	To answer this question you must understand and recall the events stated by the theory of endosymbiosis. The mitochondria was originally a prokaryote before being engulfed by proto-eukaryotes and prokaryotes have circular DNA.
17	B	B is correct as it follows the mating-mind hypothesis which supports that bigger brains are an elaborate trait that were used in attracting mates
18	A	LUCA is the short form for the last universal common ancestor and as it was likely autotrophic, it was likely able to create its own food. It was also likely a prokaryote which means that it can synthesize its own proteins.
19	B	
20	D	Phase A is diploid, phase B is a double division event, phase D is a single division event
21	C	
22	C	1 is incorrect because ionizing radiation is repaired through non homologous end joining. 2 is correct, 3 is correct, 4 is incorrect because mismatch errors are caused by synthesis mistakes in DNA polymerase.
23	D	2 is Incorrect because DNA polymerase can reverse its mistake by using a built-in 3'-5' exonuclease activity to remove mistakes. 3 is incorrect because DNA polymerase detects that the base has been mispaired. 4 is incorrect because DNA polymerase III error rate is very low
24	D	The genome size does not indicate complexity, or how big the genes are. It just indicates that there are more transposable elements making the genome large. Therefore we can agree that the bearded dragon

		has more transposable elements than the robin because its genome size is larger.
25	D	Earthworms, flowering plants and snails are all simultaneous hermaphrodites
26	D	The blue headed wrasse will begin its life as a female. Later, it will transition into a male once the male sex surpasses the female sex in reproductive success. This ensures that the blue headed wrasse is always at its greatest reproductive success.
27	C	1 is incorrect because males have a higher potential fitness because they can contribute as much as they want to the population. 3 is incorrect because females tend to be the more choosy individuals if they are more involved in parental care, while males would not be as choosy.