GVZ 2023 Practice Questions Set 1 Test 3

1 Are there any instances of convergence between Australian marsupials and Eutherians? If so, give an example.

2 Which bird lineages…

--have the greatest muscular output

--spend a lot of time in water

--have a 'penis'

--do not fly

3 According to the most recent phylogenetic studies, Birds are…

a) ornithischian dinosaurs

b) saurischian dinosaurs

c) neither a nor b.

4 *Dimetrodon* is sometimes referred to as a "mammal-like reptile." Why is this a scientifically inappropriate name for them? Also, be prepared to identify skulls/skeletons and individuals to major lineage (Archosauria, Dinosauria, Squamata, Synapsida, Aves)

5 Describe avian and nonavian examples where sexual selection has probably caused the evolution of sexual dimorphism. Be sure to describe *how* sexual selection (i.e., what kind of sexual selection) could have caused the evolution of the trait. In your examples, is there likely to be natural selection for survival countering the sexual selection?

6 Humans evolved via

a) dispersal

b) vicariance

c) both vicariance and dispersal

d) neither vicariance nor dispersal

7 Describe polyandry in birds (i.e., what is it, what morphologies and behaviors are associated with it).

8 Describe synapomorphies of Aves. Discuss these synapomorphies with reference to their functional effects on flight.

9 Do birds have an intromittent sex organ (i.e., a penis)?

10 Which of the following statements best describes the evolutionary distribution of feathers?

a) present only in birds

b) present in many theropod dinosaurs

c) present in many vertebrates

11 List and describe synapomorphies for Mammalia, *Homo*, Marsupialia, Primates, Monotremata.

12 Rank the following clades according to number of species: Aves, Dinosauria, Mammalia, Monotremata, Eutheria.

13 Describe the anatomy and phylogenetic position of *Archaeopteryx*. Why is this species considered to be an important "transitional" form?

14 How can you distinguish a rabbit skull from a mouse skull?

15 How do monotremes differ from Therian (Eutherian and marsupial) mammals? What conditions in monotremes are considered plesiomorphic relative to the conditions in therians?

16 List Eutherians and Aves that are primarily aquatic.

17 True or false: koalas are gentle, harmless creatures that resolve disputes between individuals by hugging and exchange of gifts.

18 Humans' preference for alcohol…

a) results from natural selection that favors alcohol consumption

b) results from sexual selection that favors alcohol consumption

c) probably was inherited from our ape ancestors

d) is unique to humans (i.e., not observed in other vertebrates)

19 Discuss some of the important discoveries and texts in the study of human evolution.

20 Compare the 'Multiregional' and 'Recent African Origin' hypotheses for the evolution of humans. Think of data that would support or refute each hypothesis.

21 Did human (*Homo*) species interbreed with other human-like species? If so, which other species were involved?

22 True or false: Dinosaurs are extinct. Explain your answer.

23 Compare and contrast the anatomical structures involved in the wings of different lineages of vertebrates that perform powered flight.

24 Describe the hypotheses that have been put forth to explain the evolution of powered flight in birds.

25 How are the teeth of a wolf different from the teeth of *Iguana*?

26 List and describe function for glands found in mammalian skin.

27 Describe Andersson's test of female choice in widowbirds.

28 In birds, many socially monogamous pairs experience extra-pair copulation. Many of such pairs also perform mate guarding. What factors determine when a (e.g.) male elects to guard his socially monogamous mate rather than pursue other females? (you may want to discuss the results of the study by Beecher and Beecher)

29 Neil Patrick Harris is…

A a talented, brilliant, beautiful man

B the pride of La Cueva High School

C a national treasure

D all of the above

30 How do Metatherians (marsupials) differ from Eutherians (especially reproductively)?

31 Describe the anatomy of marsupial newborns. What traits are well developed (relatively precocial) on marsupial newborns? Give a functional explanation for these traits.

32 Compare the bones in a lizard jaw to the bones in the mammalian jaw and the bones in the mammalian inner ear. Use the term "homologous" in your comparison.

33 Give vertebrate examples of homology in behavior, morphology, and molecules.

34 Give vertebrate examples of convergence/homoplasy in behavior, morphology, and molecules.

35 What characteristics distinguish old world monkeys from new world monkeys? Do these two groups form a clade separate from humans?

36 List some mammal species or groups with altricial young, and some with precocial young.

37 Describe (anatomical, behavioral, etc.) characteristics of (some) male birds that evolved as cues for female mate choice.

38 Which of the following is the closest living relative of humans?

a gorillas

b chimps

c new world monkeys

d none of the above; all are equally closely related to humans

39 Compare and contrast skull fenestration patterns in amniotes. Which taxa possess which skull types?

40 Discuss Tim Rowe's (1988) distinction between taxon *diagnoses* and taxon name *definitions*, as applied to mammals. How does he suggest to define the name Mammalia? Is his suggested definition a node-based definition, a stem-based definition, or something else?

41 Compare and contrast the views of Dan Simberloff and Mark Davis regarding "invasive" species.

Within the context of your answer, state and support your own view on the status of invasive species.

Your answer should include vertebrate examples.

42 Describe the effects of the large asteroid that hit the earth 66 million years ago. How did these effects affect the nonavian dinosaurs?

43 What approaches do male frogs use to attract a mate?

44 What is amplexus? What variation in amplexus occurs between species?

45 Describe the "alternative" mating strategies of *clutch piracy* and *functional necrophilia* in frogs. In your opinion, which of these approaches is more f-ed up?

46 Describe parental care in *Oophaga*, *Rhinella*, *Rheobatrachus*, *Pyxicephalus*, and *Pipa*.

47 Describe areas where frogs deposit eggs (kinds of nests, kinds of substrate, etc.).

48 Describe gynogenetic, kleptogenetic, and hybridogenetic breeding systems.

49 Describe the anatomy and functions of frog calls as well as aspects of frog calling that may lower an individual frog's fitness.

50 Are mosasaurs dinosaurs? How about *Spinosaurus*? *Bistahieversor?* Plesiosaurs*?*

51 Describe the anatomy of mammals (outer covering, internal anatomy)

52 Compare and contrast *Intrinsic* and *Instrumental* Value, and discuss these terms with reference to nature.

53 Compare and contrast *Utilitarianism* and *Deontology*. Can you think of ways these terms might be applied to ethical views on nature?

54 In what ways are frog eggs/babies protected from predators? (think parental care, as well as nest structure and other components of reproductive behavior).