Biol 101 Survey of Biology Exam 6 Study Questions.

1) Which one of the following was not a main idea that Darwin advanced in his works?
   A) species change over time
   B) modern species arose through a process known as "descent with modification"
   C) new species arise by natural selection
   D) living species have arisen from earlier life forms
   E) new species can form by inheritance of acquired characteristics

2) Which one of the following people developed a theory of evolution identical to Darwin's?
   A) Buffon
   B) Lamarck
   C) Wallace
   D) Lyell
   E) Huxley

3) The unifying theme of biology is
   A) genetics.
   B) taxonomy.
   C) ecology.
   D) evolution.
   E) None of the choices are correct.

4) Which one of the following did Darwin discover that led him to suspect that species in the Americas were more closely related to each other than to species elsewhere?
   A) The South American fossils he collected included many species that seemed less advanced than their modern counterparts.
   B) The South American fossils he collected were more similar to living South American species than to fossils from other continents.
   C) Many of the fossils he collected in South America belonged to species that no longer exist.
   D) The animals he found in the Galapagos resembled South American animals more closely than animals from other continents.
   E) The South American fossils he collected were more similar to North American fossils than to living South American species.

5) In the 1700s, ___ raised the possibility that certain fossil forms might be ancient versions of similar living species.
   A) Wallace
   B) Lyell
   C) Buffon
   D) Lamarck
   E) Aristotle

6) During the 1950s, a scientist named Lysenko tried to solve the food shortages in the Soviet Union by breeding wheat that could grow in Siberia. He theorized that if you took wheat plants
and exposed them to cold, they would develop additional cold tolerance and pass it to their offspring. His plan failed because
A) he assumed that exposure could induce a plant to exhibit cold tolerance.
B) he took his wheat seeds straight to Siberia instead of exposing them incrementally to cold.
C) he used wheat varieties that had lost their cold tolerance as a result of disuse.
D) he assumed that exposure could induce a plant to develop additional cold tolerance and that this tolerance would be passed to the plant's offspring.

7) Which one of the following best expresses the concept of natural selection?
A) differential reproductive success
B) a drive to perfection
C) overproduction of offspring
D) change in response to need
E) inheritance of acquired characteristics

8) Which of the following assumptions was not part of Darwin's theory of natural selection?
A) Organisms compete for limited resources.
B) Organisms vary in heritable ways.
C) The Earth is very old.
D) Traits are inherited as discrete particles.
E) Populations produce more offspring than their environment can support.

9) Malthus's essay led Darwin to which of the following generalizations?
A) Much of the phenotypic variation exhibited by members of a species is heritable.
B) All organisms produce more offspring than their environment can support.
C) Evolution is most likely to occur when populations are subjected to strong pressures such as famine and predation.
D) Famine, disease, war, and similar ills are inevitable features of the human condition.
E) Evolution proceeds more rapidly when populations are repeatedly decimated (bottleneck effect).

10) Broccoli and cabbages are both descended from the same wild mustard and can still interbreed. The existence of these two vegetables is an example of
A) artificial selection.
B) inheritance of acquired characteristics.
C) genetic drift.
D) natural selection.
E) speciation.

11) Fossils form by which of the following processes?
A) Whole organisms are sometimes preserved in ice or deep within acid bogs.
B) The remains of a dead organism are sometimes turned into stone by petrification.
C) Actual organic material remains if an organism is buried in a medium that prevents bacteria and fungi from decomposing it.
D) The hard parts of animals that are rich in minerals, such as teeth and the shells of clams, may remain as fossils.
E) All of the choices are processes that can produce fossils.

12) The fossil record shows all of following except that
A) the earliest fossils of life are about 3.5 billion years old.
B) within the vertebrates, fish were the first to evolve.
C) the first life forms were eukaryotes.
D) some fossils represent an evolutionary series of changes that provide strong documentation of evolution.
E) younger strata are on top of older strata.

13) Which of the following provides evidence that modern species have evolved from prior species?
A) molecular biology
B) comparative embryology
C) biogeography
D) comparative anatomy
E) All of the choices are correct.

14) Which of the following provides evidence that vertebrates evolved from a common ancestor?
A) the common development of pharyngeal pouches in an embryonic stage
B) the presence of similar genes
C) similarities in protein structure
D) homologous structures
E) All of the choices are correct.

15) Darwin found that Galapagos animals resembled species of the South American mainland
A) less than they resembled animals on similar but distant islands.
B) less than they resembled animals in Europe.
C) more than they resembled animals on similar but distant islands.
D) less than they resembled animals from Australia.
E) None of the choices are correct.

16) Which one of the following represents two structures that are homologous?
A) the antennae of an insect and the eyes of a bird
B) the feathers of a bird and the salt glands of a blue-footed booby
C) the wing of a bat and the scales of a fish
D) the legs of a fly and the wings of a bird
E) the wing of a bat and the flipper of a whale

17) Which one of the following is false? Natural selection
A) is contingent upon time and place.
B) and evolutionary change can occur in a short time.
C) can be seen to be working in organisms alive today.
D) results from an organism's needs.
E) is more of an editing process than a creative mechanism.
18) Which of the following constitutes a basic, modern definition of a sexually reproducing species?
A) a group of individuals who resemble each other, on average, more than they resemble anything else
B) a group of individuals living in the same place at the same time
C) a group of populations whose members can interbreed and produce fertile offspring
D) the smallest unit that can engage in microevolution
E) a group of individuals who interbreed

19) A population is
A) a group of individuals of different species living in the same place at the same time.
B) the smallest unit that can evolve.
C) applicable only to animals that reproduce asexually.
D) a collection of communities.
E) All of the choices are correct.

20) The modern evolutionary synthesis
A) incorporates population genetics and ideas from paleontology, taxonomy, and biogeography.
B) was first formed in the 1940s.
C) includes the central role of natural selection.
D) focuses on populations as the units of evolution.
E) All of the choices are correct.

21) A change in the relative frequencies of alleles in the gene pool of a population is called
A) mutation.
B) diversifying selection.
C) directional selection.
D) microevolution.
E) genetic drift.

22) In the Hardy-Weinberg equation, homozygous dominant individuals in a population are represented by
A) q or p.
B) q to power of (2).
C) p to power of (2).
D) 2pq.
E) None of the choices are correct.

23) Which of the following conditions would tend to make the Hardy-Weinberg equation more accurate for predicting the gene frequencies of future generations in a population of a sexually reproducing species?
A) a small population size
B) little gene flow with surrounding populations
C) the existence of directional selection
D) mutations that alter the gene pool
E) a tendency on the part of females to mate with the healthiest males

24) Genetic drift resulting from a disaster that drastically reduces population size is called
A) natural selection.
B) the founder effect.
C) nonrandom mating.
D) gene flow.
E) the bottleneck effect.

25) A population of 1,000 birds exists on a small Pacific island. Some of the birds are yellow, a characteristic determined by a recessive allele. The others are green, a characteristic determined by a dominant allele. A hurricane on the island kills most of the birds from this population. Only ten remain, and those birds all have yellow feathers. Which of the following statements is true?
A) The ten remaining birds will mate only with each other, and this will contribute to gene flow in the population.
B) The hurricane has caused a population bottleneck.
C) This situation illustrates the founder effect.
D) Assuming that no new birds come to the island and no mutations occur, future generations of this population will contain both green and yellow birds.
E) This situation illustrates the principle of adaptive radiation.

26) Thirty people are assigned to live in a spaceship that is exploring other galaxies. The journey will take several hundred years and will be completed by the descendants of these crew members. The gene pool of the population on this ship when it returns is most likely to reflect
A) mutation pressure.
B) a founder effect.
C) polymorphism.
D) a bottleneck effect.
E) gene flow.

27) Genetic differences between populations tend to be reduced by
A) the founder effect.
B) gene flow.
C) None of the choices are correct.
D) mutation.
E) the bottleneck effect.

28) The degree of adaptation that can occur in a population is limited by
A) the amount and kind of genetic variation in a population.
B) the need of the individuals.
C) None of the choices are correct.
D) the amount of genetic variation in a population.
E) the kind of genetic variation in a population.

29) Certain whale species were hunted to near extinction. With a moratorium on hunting them, their population sizes have expanded. Which of the following is true?
A) The populations have recovered and have demonstrated that populations have the potential to recover completely from being driven to near extinction.
B) The populations may still be endangered because they may have little remaining genetic variation.
C) Hunting is a form of stabilizing selection.
D) Whale species have a high reproductive rate.
E) Hunting can "refresh" a whale species and increase its overall fitness.

30) Which one of the following increases the chances that a mutation will significantly affect genetic variation from one generation to the next in most plants and animals?
A) diploid genomes
B) long generation times
C) high mutation rates
D) All three of the choices increase the chances that a mutation will significantly affect genetic variation from one generation to the next.
E) None of the choices are correct.

31) An individual who does not finish all of a prescribed antibiotic is
A) smart to save the antibiotic for the next time the illness strikes.
B) assuring that the bacterial strain will remain sensitive to that antibiotic.
C) promoting genetic drift in the bacterial population.
D) subjecting the bacterial population to stabilizing selection.
E) adversely affecting the health of all individuals who, in the future, may be exposed to that bacterial strain.

32) Fitness increases when an organism
A) passes on a greater proportion of its genes to the next generation.
B) lives for a long time.
C) survives many hardships.
D) is disease-free.
E) is stronger than the other organisms in its community.

33) An elk herd is observed over many generations. Most of the full-grown bull elk have antlers of nearly the same size, although a few have antlers that are significantly larger or smaller than this average size. The average antler size remains constant over the generations. Which of the following effects probably accounts for this situation?
A) a bottlenecking effect that resulted in low genetic diversity
B) a founder effect that resulted in low genetic diversity
C) a high rate of gene flow
D) directional selection
E) stabilizing selection

34) Long-legged cheetahs are well adapted to catching prey. The ancestor of the cheetah is believed to have had relatively short legs. According to Darwinian views, the evolution of long-legged cheetahs is best explained by
A) stabilizing selection.
B) directional selection.
C) the theory of acquired characteristics.
D) disruptive selection.
E) heterozygote advantage.

35) A rabbit population consists of animals that are either very dark on top or very light on top. When examining them closely, biologists were surprised to find no rabbit with a medium darkness, intermediate to the two extremes. This is an example of
   A) directional selection.
   B) disruptive selection.
   C) stabilizing selection.
   D) heterozygote advantage.
   E) sexual selection.

36) Natural selection and the ability to generate perfection are limited by all of the following except that
   A) organisms are limited by historical constraints.
   B) chance and natural selection interact.
   C) adaptations are often compromises.
   D) selection can only edit existing variations.
   E) organisms with the greatest fitness often don't reproduce.

37) Which one of the following is not characteristic of macroevolution?
   A) the generation of biodiversity
   B) the gradual adaptation of a population to its environment
   C) the formation of new species
   D) dramatic biological changes
   E) All of the choices are characteristic of macroevolution.

38) A biological species is defined as a
   A) group of phenotypically indistinguishable organisms.
   B) group of organisms that are phenotypically similar and that share a high proportion of genes.
   C) population or group of populations whose members have the potential to interbreed and produce fertile offspring.
   D) population or group of geographically contiguous populations whose members are phenotypically similar.
   E) group of organisms that share an ancestral-descendant sequence.

39) Speciation can occur as a result of reproductive isolation. Reproductive isolation can occur when individuals in two populations of organisms
   A) use different types of behaviors to attract mates.
   B) can't mate with each other because mating occurs at different times.
   C) have anatomical features that make it difficult for organisms from the different populations to mate and transfer sex cells.
   D) mate with each other but produce offspring that are nonviable.
   E) All of the choices are correct.
40) Which of the following types of reproductive barriers separates a pair of species that could interbreed except that one mates at dusk and the other at dawn?
A) gametic isolation
B) mechanical isolation
C) habitat isolation
D) behavioral isolation
E) temporal isolation

41) Two species that sometimes mate and produce vigorous, sterile offspring are separated by
A) gametic isolation.
B) hybrid competition.
C) hybrid sterility.
D) hybrid inviability.
E) hybrid breakdown.

42) Which one of the following is an example of a hybrid that is both vigorous and sterile?
A) a pony
B) a mule
C) a donkey
D) a cross between a thoroughbred racehorse and a mustang horse
E) a colt

43) The Monterey pine and Bishop's pine inhabit some of the same areas of central California. The Monterey pine releases pollen in February, while the Bishop's pine does so in April. This is an example of ___ isolation.
A) temporal
B) habitat
C) postzygotic
D) mechanical
E) behavioral

44) Organisms having more than two complete sets of chromosomes are said to be
A) polyploid.
B) chimeric.
C) haploid.
D) multinucleate.
E) hybrids.

45) When a tetraploid plant pollinates a diploid plant of the parental species, what will be the ploidy of the resulting zygote?
A) diploid
B) tetraploid
C) triploid
D) pentaploid
E) haploid
46) The emergence of numerous species from a common ancestor that finds itself in a new and diverse environment is called
A) diversifying selection.
B) adaptive radiation.
C) adaptive opportunism.
D) bushy evolution.
E) allopatric radiation.

47) Which one of the following statements about the Galaccent(a) pagos finches is false?
A) The Galaccent(a) pagos finch species differ in their feeding habitats.
B) The common ancestor of the Galaccent(a) pagos finches appears to have come from the island of Cocos.
C) The evolution of the Galaccent(a) pagos finches is an excellent example of adaptive radiation.
D) There are 14 species of Galaccent(a) pagos finches.
E) Most speciation events of the Galaccent(a) pagos finches occurred when some finches made it to another island and evolved by allopatric speciation.

48) Evolution is a response to interactions between organisms48)
A) their genomes.
B) their current environment.
C) their past environment.
D) their past, current, and future environment.
E) their future environment.

49) Which one of the following is most analogous to the evolutionary history of most animal groups?
A) a single-file line of people
B) a field of wild plants
C) a forest
D) grains of sand on a beach
E) a bush

50) Which of the following correctly states the relationship between dinosaurs and birds?
A) Biologists now widely accept that birds were not descended from dinosaurs.
B) Biologists now widely accept that birds were descended from dinosaurs.
C) Biologists now widely accept that dinosaurs were descended from birds.
D) The evolutionary relationship between birds and dinosaurs remains uncertain because no fossils exist that help to determine the relationship.
E) Biologists have always considered birds to be descended from dinosaurs.

51) By studying fossils in strata from many locations, scientists can learn about
A) divergent homoplasy.
B) molecular evolution.
C) macroevolution.
D) counterevolution.
52) The earliest discovered fossils are ___ dating back to ___ years ago.
A) dinosaurs . . . 180 million
B) prokaryotes . . . 3.5 billion
C) fish . . . 600 million
D) algae . . . 1 billion
E) single-celled eukaryotes . . . 4.5 billion

53) The earliest known flowering plants date to the
A) Cenozoic.
B) Mesozoic.
C) Cambrian.
D) Oligocene.
E) Paleozoic.

54) If all of Earth's history were compressed into an hour, humans would first appear about
A) 10 minutes ago.
B) one second ago.
C) one hour ago.
D) 10 seconds ago.
E) one minute ago.

55) If an isotope has a half-life of 4 million years, and a fossil is 16 million years old, how much of the original isotope will be found in the fossil?
A) one-sixteenth of the original amount
B) half the original amount
C) all of the original amount
D) one-eighth of the original amount
E) one-quarter of the original amount

56) The technique called radiometric dating is based on
A) the amount of moisture found in the atmosphere when an organism dies.
B) the measurement of certain radioactive isotopes contained in fossils.
C) the type of plant material that an animal consumed.
D) the atomic isotopes of the rocks surrounding fossilized organisms.
E) None of the choices are correct.

57) The Galaccine(a) pagos islands formed as a result of:
A) erosion of a large mountain mass.
B) earthquakes.
C) hurricanes.
D) coastal deposition from a large river.
E) volcanoes.

58) How many periods of mass extinction have occurred in the last 600 million years?
59) Which of the following is the process by which species not closely related may come to resemble one another if they live in a similar environment?
A) similar evolution
B) coevolution
C) parallel evolution
D) convergent evolution
E) neoteny

60) Structures that evolved from the same structure in an ancestor are
A) homologous.
B) analogous.
C) homoplasies.
D) heterologous.
E) None of the choices are correct.

61) The similarities in function of hummingbird wings and the wings of a butterfly reflect
A) analogy, homology, and homoplasy.
B) homology but not analogy.
C) analogy but not homology.
D) homology but not homoplasy.
E) analogy and homology.

62) Which of the following is written correctly? The scientific name of the human species is
A) homo sapiens.
B) Homo sapien.
C) Homo sapiens.
D) Homo.
E) Sapiens.

63) Which of the following choices lists taxonomic categories in order from most specific to most general?
A) genus, family, class, order, phylum
B) family, genus, order, phylum, class
C) family, genus, class, order, phylum
D) genus, family, order, class, phylum
E) genus, phylum, family, order, class

64) Ever since Darwin, systematics has tried to
A) provide a hierarchical classification system and explain the mechanisms of evolutionary change.
B) identify the causes of evolutionary change and reflect evolutionary relationships.
C) reflect evolutionary relationships.
D) provide a hierarchical classification system that reflects evolutionary relationships.
E) provide a hierarchical classification system.
65) Which one of the following statements is false?
A) Parsimony is a quest for the simplest explanation for observed phenomena.
B) In a cladistic analysis, the outgroup helps distinguish primitive characters from derived characters.
C) Phylogenetic systematics tries to make classification as consistent as possible with the evolutionary history of a group.
D) In a cladistic analysis, new traits are called derived characters and original traits are said to be primitive characters.
E) Cladistic analysis attempts to make sure that all clades are polyphyletic.

66) A mother comes home to find cookie crumbs on the kitchen counter and children who are not interested in eating any dinner. She asks if they ate cookies and they deny doing so. Instead, the children explain that a pack of dogs broke into the home and ate the cookies. Then the dogs left. Now the kids don't feel like eating. The mother doubts the story, using the principle of
A) phylogenetic analysis.
B) natural selection.
C) outgroup comparison.
D) inheritance of acquired characteristics.
E) parsimony.

67) Which of the following can be accomplished using molecular systematics?
A) examine the genetic divergence among individuals within a species
B) examine the evolutionary relationships between groups with no fossil record
C) examine evolutionary relationships of distant groups in which structural similarities are absent
D) All of the choices can be accomplished using molecular systematics.
E) None of the choices can be accomplished using molecular systematics.

68) The three-domain system
A) subdivides the prokaryotes into 2 different domains.
B) no longer distinguishes between eukaryotes and prokaryotes.
C) is based upon the presence or absence of cell walls.
D) separates plants, animals, and fungi.
E) subdivides the eukaryotes into 2 different domains.

69) In the three-domain system, the eukaryotes are represented
A) only by the Domain Eukarya.
B) by the domains Bacteria and Archaea.
C) by the domains Archaea and Eukarya.
D) only by the Domain Archaea.
E) in all three domains.