Name: Date:	ID: A
-------------	-------

Evolution Exam

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- 1. The biological species concept is inadequate for grouping
 - a. plants.
 - b. parasites.
 - c. asexual organisms.
 - d. animals that migrate.
 - e. overlapping populations.

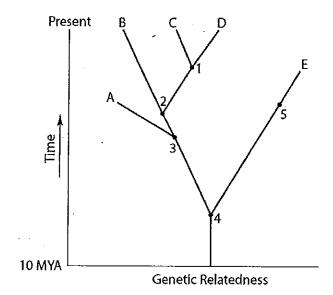
Use the information below to answer the following questions.

A researcher compared the nucleotide sequences of a homologous gene from five different species of mammals with the homologous human gene. The sequence homology between each species' version of the gene and the human gene is presented as a percentage of similarity.

Species	Percentage
Chimpanzee	99.7
Orangutan	98.6
Baboon	97.2
Rhesus Monkey	96.9
Rabbit	93.7

- 2. What conclusion can be drawn validly from these data?
 - a. Humans and other primates evolved from rabbits within the past 10 million years.
 - b. Baboons evolved from Rhesus monkeys some time ago.
 - c. Among the organisms listed, humans shared a common ancestor most recently with chimpanzees.
 - d. Humans evolved from chimpanzees somewhere in Africa within the last 6 million years.
 - e. Both B and D are correct.
- 3. Given a population that contains genetic variation, what is the correct sequence of the following events, under the influence of natural selection?
 - 1. Differential reproduction occurs.
 - 2. A new selective pressure arises.
 - 3. Gene frequencies within the population change.
 - 4. Poorly adapted individuals have decreased survivorship.
 - a. 2, 4, 1, 3
 - b. 4, 2, 1, 3
 - c. 4, 1, 2, 3
 - d. 4, 2, 3, 1
 - e. 2, 4, 3, 1

Use the figure below to answer the following questions.



- 4. A common ancestor for both species C and E could be at position number
 - a. 1.
 - b. 2.
 - c. 3.
 - d. 4.
 - e. 5.
- 5. The two extant species that are most closely related to each other are
 - a. A and B.
 - b. B and C.
 - c. C and D.
 - d. D and E.
 - e. E and A.
- 6. Which species are extinct?
 - a. A and E
 - b. A and B
 - c. C and D
 - d. D and E
 - e. cannot be determined from the information provided
- 7. Darwin had initially expected the living plants of temperate South America to resemble those of temperate Europe, but he was surprised to find that they more closely resembled the plants of *tropical* South America. The biological explanation for this observation is most properly associated with the field of
 - a. meteorology.
 - b. embryology.
 - c. vertebrate anatomy.
 - d. bioengineering.
 - e. biogeography.

	8.	The existence of evolutionary trends, such as increasing body sizes among horse species, is evidence that
		a. a larger volume-to-surface area ratio is beneficial to all mammals.
		b. an unseen supernatural force is at work.
		c. evolution always tends toward increased complexity or increased size.
		d. in particular environments, similar adaptations can be beneficial in more than one
		species.
		e. evolution generally progresses toward some predetermined goal.
	9.	Through time, the movement of people on Earth has steadily increased. This has altered the course of human
		evolution by increasing
		a. directional selection.
		b. geographic isolation.
		c. genetic drift.
		d. mutations.
		e. gene flow.
	10.	Which statement about natural selection is <i>most</i> correct?
		a. Adaptations beneficial in one habitat should generally be beneficial in all other habitats
		as well.
		b. Different species that together occupy the same habitat will adapt to that habitat by
		undergoing the same genetic changes.
		c. Adaptations beneficial at one time should generally be beneficial during all other times
		as well.
٠.		d. Well-adapted individuals leave more offspring, and thus contribute more to the gene
		pool, than poorly adapted individuals.
		e. Natural selection is the sole means by which populations can evolve.
	11.	Which of the following statements is <i>not</i> an inference of natural selection?
		a. Subsequent generations of a population should have greater proportions of individuals
		that possess favorable traits.
		b. An individual organism undergoes evolution over the course of its lifetime.
		c. Often only a fraction of offspring survive, because there is a struggle for limited
		resources.
		d. Individuals whose inherited characteristics best fit them to the environment should leave
		more offspring.
		e. Unequal reproductive success among its members leads a population to adapt over time.
	12.	The Darwinian fitness of an individual is measured by
		a. the number of its offspring that survive to reproduce.
		b. the number of supergenes in the genotype.
		c. the number of mates it attracts.
		d. its physical strength.
		e. how long it lives.
	13.	Male satin bowerbirds adorn structures that they build, called "bowers," with parrot feathers, flowers, and
		other bizarre ornaments in order to attract females. Females inspect the bowers and, if suitably impressed,
		allow males to mate with them, after which they go off to nest by themselves. The evolution of this behavior
		is best described as due to
		a. stabilizing selection.
		b. artificial selection.
		c. sexual selection.
		d. natural selection.
		e. disruptive selection.

Name: _

Name:	
	All of the following are criteria for maintaining Hardy-Weinberg equilibrium involving two alleles except a. the frequency of all genotypes must be equal. b. there should be no natural selection. c. matings must be random. d. populations must be large. e. gene flow from other populations must be zero. Which combination of the following species characteristics would cause the greatest likelihood of fossilization in sedimentary rock? I. The species was abundant.
	 II. The species was widespread. III. The species had hard body parts. IV. The species was adapted to desert life. V. The species had a long duration in geologic time.
	a. III only b. III and IV c. I, II, and III d. I, II, and V e. I, II, III, and V
16.	Which of the following pieces of evidence most strongly supports the common origin of all life on Earth? a. All organisms require energy. b. All organisms use essentially the same genetic code. c. All organisms reproduce. d. All organisms show heritable variation. e. All organisms have undergone evolution.
17.	According to the concept of punctuated equilibrium, the "sudden" appearance of a new species in the fossil record means that a. the species is now extinct. b. speciation occurred instantaneously. c. speciation occurred slowly over time. d. speciation occurred rapidly in geologic time. e. the species will consequently have a relatively short existence, compared with other species.
18.	You are confronted with a box of preserved grasshoppers of various species that are new to science and have not been described. Your assignment is to separate them into species. There is no accompanying information as to where or when they were collected. Which species concept will you have to use? a. biological b. phylogenetic c. ecological d. paleontological e. morphological
19.	Cattle breeders have improved the quality of meat over the years by which process? a. artificial selection b. directional selection c. stabilizing selection d. A and B e. A and C

ID: A	Name:
Natural selection is based on all of the following except a. variation exists within populations. b. the fittest individuals tend to leave the most offspring. c. there is differential reproductive success within populations. d. populations tend to produce more individuals than the environment can support. e. individuals must adapt to their environment.	2
'Improving the intelligence of an adult through education will result in that adult's descendants being born with a greater inborn intelligence." This statement is an example of a. Darwinism. b. Lamarckism. c. uniformitarianism. d. catastrophism. e. Malthusianism.	2
Both Darwin's and Lamarck's ideas regarding evolution suggest which of the following? a. All species were fixed (unchanging) at the time of creation. b. Acquired physical characteristics can be inherited. c. The giraffe's long neck is the result of artificial selection. d. The main mechanism of evolution is natural selection. c. The interaction of organisms with their environment is important in the evolutionary process.	2
Two species of frogs belonging to the same genus occasionally mate, but the offspring do not complete development. What is the mechanism for keeping the two frog species separate? a. the postzygotic barrier called hybrid inviability b. the postzygotic barrier called hybrid breakdown c. the prezygotic barrier called hybrid sterility d. gametic isolation e. adaptation	2
Races of humans are unlikely to evolve extensive differences in the future for which of the following teasons? The environment is unlikely to change. Human evolution is complete. H. The human races are incompletely isolated.	2
I only I and II only I and III only I III and III only III and III III only III and IIII III only III and IIII III only	2

Name:	ID: A
26.	Structures as different as human arms, bat wings, and dolphin flippers contain many of the same bones, these bones having developed from the same embryonic tissues. How do biologists interpret these similarities? a. by identifying the bones as being homologous b. by proposing that structures are adapting to their paticular environment c. by proposing that humans, bats, and dolphins share a common ancestor d. A and C only e. A, B, and C
27.	Successfully breeding two individual organisms at a zoo and obtaining fertile offspring for several generations is no guarantee that the same could occur in nature (i.e., in the wild). Which species concept becomes difficult to confirm because of this fact? a. biological b. ecological c. morphological d. phylogenetic e. paleontological
28.	 a. occurs at such a slow pace that no one has ever observed the emergence of new species. b. occurs only by the accumulation of genetic change over vast expanses of time. c. must begin with the geographic isolation of a small, frontier population. d. proceeds at a uniform rate across all taxa. e. occurs at variable rates and most commonly occurs after subpopulations have have been geographically isolated.
29.	 What was the prevailing notion prior to the time of Lyell and Darwin? a. Earth is 6,000 years old, and populations are unchanging. b. Earth is 6,000 years old, and populations gradually change. c. Earth is millions of years old, and populations rapidly change. d. Earth is millions of years old, and populations are unchanging. e. Earth is millions of years old, and populations gradually change.
30.	 During drought years on the Galapagos, small, easily eaten seeds become rare leaving only large, hard-cased seeds that only birds with large beaks can eat. If a drought persists for several years, then what should one expect to result from natural selection? a. Small birds gaining larger beaks by exercising their mouth parts. b. Small birds mutating their beak genes with the result that later-generation offspring have larger beaks. c. Small birds anticipating the long drought and eating more to gain weight and, consequently, growing larger beaks. d. More small-beaked birds dying than the larger-beaked birds. The offspring produced in subsequent generations have a higher percentage of birds with large beaks. e. Larger birds eating less so smaller birds can survive.
31.	Gene flow is a concept best used to describe an exchange between a. species. b. males and females. c. populations. d. individuals. e. chromosomes.

Nam	ıe:	ID: A
	32.	the second of the second second in a population of the second in a population of the second in the second s
		a. Individual members of the population slowly adapt to the presence of the chemical by striving to meet the new challenge.
		b. All insects exposed to the insecticide begin to use a formerly silent gene (one not used
		before) to make a new enzyme that breaks down the insecticide molecules.
		c. Insects observe the behavior of other insects that survive pesticide application, and adjust their own behaviors to copy those of the survivors.
		d. A number of genetically resistant pesticide survivors reproduce. The next generation of
		insects contains more genes from the survivors than it does from susceptible individuals.
		e. Individual members of the population decided to mutate in order to get the resistence they needed.
	33.	·
		a. that evolution occurs.
		b. a mechanism for how evolution occurs.
		c. that the Earth is older than 6,000 years.d. a mechanism for evolution that was supported by evidence.
		e. a way to use artificial selection as a means of domesticating plants and animals.
	34.	
		digestive systems. Whales have lost their hind limbs. How can natural selection account for these losses?
		a. Natural selection cannot account for losses, only for innovations.
		b. It can account for these losses by the principle of use and disuse.
		c. Under particular circumstances that persisted for long periods, each of these structures presented greater costs than benefits.
		d. These organisms had the misfortune to experience harmful mutations, which caused the
		loss of these structures.
		e. B and D only
		Use the options below to answer the following questions. For each description of reproductive isolation, select the option that best describes it. Options may be used once, more than once, or not at all.
		A. gametic
		B. temporal
		C. behavioral
		D. habitat E. mechanical
	35.	two species of meadowlarks with different mating songs
		a. A b. B
		c. C
		d. D
		e. E
	36.	two species of orchids with different floral anatomy
		a. A
		b. B c. C
		c. C d. D
		e. E

Name:	ID: A
•	
37.	two species of trout that breed in different seasons
	a. A
	b. B
	c. C
	d. D
	e. E
38.	in the forelimbs of such diverse mammals as horses, whales, and bats. That the actual forelimbs of these
٠	mammals do not seem to be optimally arranged is because
	 natural selection has not had sufficient time to create the optimal design in each case, but will do so given enough time.
	b. natural selection operates in ways that are beyond the capability of the human mind to comprehend.
	c. in many cases, traits are not merely determined by genes, but by the environment as well.
	d. though we may not consider the fit between the current skeletal arrangements and their
	functions excellent, we should not doubt that natural selection ultimately produces the best design.
	e. natural selection is generally limited to modifying structures that were present in
÷	previous generations and in previous species.
39.	
35.	· · · · · · · · · · · · · · · · · · ·
	a. an educated guess about how species originate.
	 one possible explanation, among several scientific alternatives, about how species have come into existence.
	c. an opinion that some scientists hold about how living things change over time.
	 an overarching explanation, supported by much evidence, for how populations change over time.
	e. an idea about how acquired characteristics are passed on to subsequent generations.
40.	In a hypothetical situation, a certain species of flea feeds only on pronghorn antelopes. In rangelands of the
	western United States, pronghorns and cattle often associate with one another. If it should happen that some
	of these fleas develop a strong preference, instead, for cattle blood and mate only with fleas that, likewise,
	prefer cattle blood, it is possible that over time will occur.
	1. reproductive isolation
	2. sympatric speciation
	3. habitat isolation
	4. prezygotic barriers
-	5. another branch will be added to the "tree of life"
	a louis
	a. 1 only b. 2 and 3
	c. 1, 2, and 3
	d. 1, 2, 3, and 5
	e. 1 through 5

45. The following important concepts of population genetics are due to random events or chance except

a. mutation.

d.

b. the bottleneck effect.

nonrandom mating.

differential reproductive success.

c. the founder effect.

d. natural selection.

e. sexual recombination.

Name: _	
46	5. The ostrich and the emu look very similar and live in similar habitats, however they are not very closely
	related. This is an example of
	a. divergent evolution.
	b. convergent evolution.
	c. artificial selection.
	d. adaptive radiation.
	e. sympatric speciation.
47	, , , , , , , , , , , , , , , , , , ,
	a. is the same as a hypothesis; a possible explanation to a causal question.
	b. is a speculation lacking supportive observations or experiments.
	c. attempts to explain many related phenomena and observations.
	d. is considered a law in nature.
	e. scientists use to prove something.
48	y y and an array are a supplied to the
	a. more similar their habitats are.
	b. less similar their DNA sequences are.
	c. more recently they shared a common ancestor.
	d. less likely they are to be related to fossil forms.
	e. more similar they are in size.
49	The same gene that causes various coat patterns in wild and domesticated cats also causes the cross-eyed condition in these cats, the cross-eyed condition being slightly maladaptive (bad). In a hypothetical environment, the coat pattern that is associated with crossed eyes is highly adaptive (good), with the resu that both the coat pattern and the cross-eyed condition increase in a feline population over time. Which statement is best supported by these observations?
	a. Evolution is progressive and tends toward a more perfect population.
	b. Characteristics are often the result of compromise.
	 Natural selection reduces the frequency of maladaptive genes in populations over the course of time.
	 Natural selection increases the frequency of maladaptive genes in populations over the course of time.
	e. In all environments, coat pattern is a more important survival factor than is eye-muscle tone which controls the orientation of eyes.
50.	A defining characteristic of allopatric speciation is
	a. the appearance of new species in the midst of old ones.
	b. asexually reproducing populations.
	c. geographic isolation.
	d. artificial selection.
	e. large populations.

	Nam	ie: /	4V0	LUTIC	W CX	اوع ا	u <u>1141</u>	psie	4-16-
1000			<u> </u>	_			2.	3	40
2089-89		group	1 st	dig	jit 💍	6	7	8 🗀	9 🔾
2000		¥.				1	2	3	4 (
	늣	digit d	2 nd	dig	jit 5	6()	7()	8	9 ()
1963.18	Ď	eact				1	2		4
335.45	Ε	Ë	3 _{tq}	dig	jit — 5 —	6	7 🔾	8 🗀	9 🗀
S(2) 94	Ţ	ppe				1	2()		4
0,400	_	2	4 th	dig)it 5 (6 C	7 ()	8 ()	9 🕽 .
8048	$\underline{\Box}$	mark only one bubble in each	C:b		0	1	2	3□	4
点长皂		le l	5 th	dig	^{]it} 5	6	7	8 🔾	9 🔾
109.8		ark	Oib			100	2()	3	4()
454,451		£	6 th	dig	^{jit} 5	6CD	7 ()	8	9 ()
128		1	— A	\bigcirc	_в	c		Ē	_ F
65.35		2	·A		в⊂∷:	C∰∰	D()	ECID	F()
2009/49		3 -	—A	639	в	—c—	-□□	-Е	F ◯
732AZ	٠	4	A:		вс:::::	cc::::>	D 🍩	ЕС)	F()
9-36-5		5	A	<u> </u>	-в⇔-	—c	-DC	-E	–F (გ
6.5 2.65		6	A	*** ····	в	cc::::>	DC	EC)	F⊂⊃ 🗟
(2)智慧		7	A	<u> </u>	ВС	_c	—Dİ	E 🚳	−೯⇔ ឆ្ល័
8.98.5	-	8	···· A	C:::>	ВС∷∵	c::::::	D	E()	F⊂⊃ ਫ਼ੁੱ
27.94		9 -	A	\bigcirc	− 8○>	_c○_	- D	E €®	F C N
5WW		10 -	A		ВС∷∷	c(Ď	E()	FCD €
6646		11 -	—A	\bigcirc	-В ДЭ	–c⊃–	DC	-E	_ғ _ ≗
17658		12	A	(E)	вс>	C()	DC	E()	F(CD)
學數學		13 -	— A	\bigcirc	-в —	— C @	~D○	-E	-F □
87.05E	•	14 -	A	***	BC}	c	DC	••E()	FCD
1200		15 ·	A	\bigcirc	-ВС⊃-	—c —	-¤C>	E	-F○
190G		16 -	A		B €	CC	DC	E()	FCIII)
100			A		-BC⊃-	—¢⊝—	D €	-E◯-	-F○ -
2010			A		В∭	c	DC	E∰∰	
		19 -			−B	—c⊖—	-D@≫—	-E	_t ë
			A :		BC∷∷	c:::	···D()-···	E @ ##···	
		21 -	— A		B (€€€6)	—c⊖—	-DC──	- E	
			· A :		ВС	c	D		
		23 ·		<u>.</u>	⊸B()	—cϢ— ····c∭—	-D◯—	e	FCD
						—c—			
						c			
						_c <u></u>			
VAR25						c			
2/9/3						−c			E
*******		30 -	A		вс∷	····c()	····D缥缈····	E(-r⊖ .is
5,974						—с ®			–F ◯ ਹੂੰ
改称等						c			
7823						_c_			–F (ენ
StpM						····C 🐲 ···			
78:835		35 -	A	\supset	-B○-	—с	- D○	-E (–F ◯ ੂੰ
4.57%						c			F() ₩
400,4						_c			-F ◯ të
\$20 A COR						c			F □
2335						—c⊝– c∷			
Applicação Transportação						c○			
V-26						—c— c—			
.36.3.3						c○			—E () 8
						—ს <u>—</u> c::::			gi
Service of the servic						c <u></u>			-F(
387.58						c∷			F(
100 mm 100 100 mm 100 mm 100 100 mm 100 mm 100 100 mm 1						—c			73
						C			F(□) #
200						_c			
7 × 140						c			
									₹

٠.