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QUESTION 1

Which option is not an example of vertical social mobility?

A. An individual loses his job and becomes homeless.

B. An individual is promoted to a much more powerful position within the same company.

C. An individual changes jobs and moves to a similar position at another company.

D. All options are examples of vertical social mobility.

Correct Answer: C

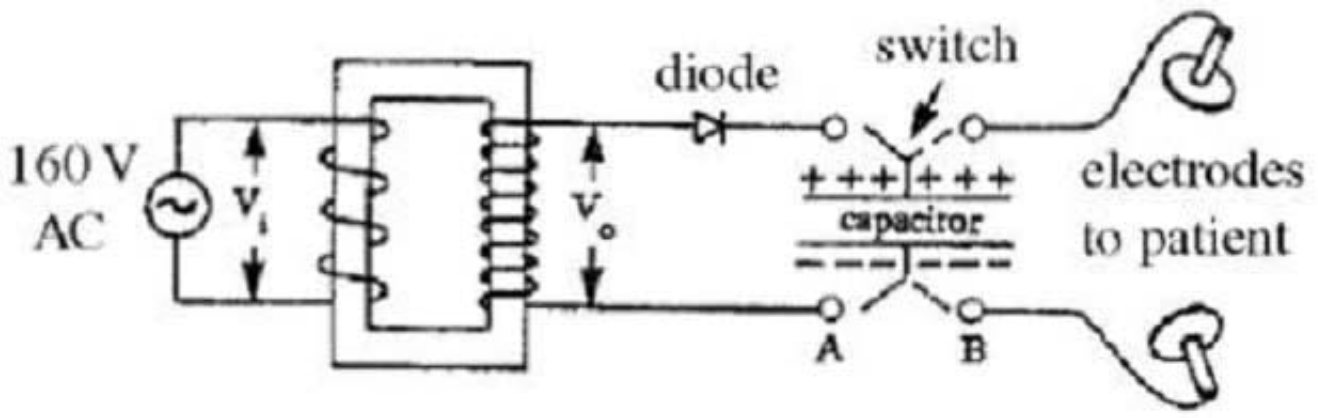
Vertical social mobility involves a change in status. Moving to a similar position would not affect an individual\\'s status.

QUESTION 2

The periodic beating of the heart is controlled by electrical impulses that originate within the cardiac muscle itself. These pulses travel to the sinoatrial node and from there to the atria and the ventricles, causing the cardiac muscles to contract. If a current of a few hundred milliamperes passes through the heart, it will interfere with this natural system, and may cause the heart to beat erratically. This condition is known as ventricular fibrillation, and is life-threatening. If, however, a larger current of about 5 to 6 amps is passed through the heart, a sustained ventricular contraction will occur. The cardiac muscle cannot relax, and the heart stops beating. If at this point the muscle is allowed to relax, a regular heartbeat will

usually resume.

The large current required to stop the heart is supplied by a device known as a defibrillator. A schematic diagram of a defibrillator is shown below. This device is essentially a "heavy-duty" capacitor capable of storing large amounts of energy. To charge the capacitor quickly (in 1 to 3 seconds), a large DC voltage must be applied to the plates of the capacitor. This is achieved using a step-up transformer, which creates an output voltage that is much larger than the input voltage. The transformer used in this defibrillator has a step-up ratio of 1:50.



The AC voltage that is obtained from the transformer must then be converted to DC voltage in order to charge the capacitor. This is accomplished using a diode, which allows current flow in one direction only. Once the capacitor is fully charged, the charge remains stored until the switch is moved to position B and the plates are placed on the patient\\'s chest. To cut down the resistance between the patient\\'s body and the defibrillator, the electrodes are covered with a wetting gel before use. Care must be taken to insure that the patient is not in electrical contact with the ground while the

defibrillator is in use.

If a dielectric was inserted between the plates of the capacitor in the defibrillator when the switch is in position A:

A. the energy stored in the capacitor would increase.

B. the energy stored in the capacitor would decrease.

C. the electric field between the plates would increase.

D. the electric field between the plates would decrease.

Correct Answer: A

Since the capacitor is, in effect, connected to a constant voltage source, the potential difference doesn\\'t change when a dielectric is inserted between the plates. Therefore, the charge on the plates must increase to compensate for the effect of the polarization of charge in the dielectric. The polarization of charge in the dielectric sets up an electric field opposite in direction and weaker in magnitude than the electric field due to the charge on the capacitor plates. This would decrease the net electric field between the plates if the capacitor were not connected to a constant voltage source. However, since it is connected to a constant voltage source when the dielectric is inserted, additional charge builds up on the plates to keep the potential difference constant. Therefore, the net electric field between the plates with the dielectric in place is equal to the net electric field between the plates with no dielectric and choices C and D are wrong. Since the charge on the plates increases, the energy stored will increase because the energy stored is given by (1/2) QVk, where Q is the charge on the plates and V is the potential difference between the plates. Therefore, choice A is correct.

QUESTION 3

Breast milk is proven to be the best form of nutrition for infants and is recommended for at least 1 year after birth. Unfortunately, a recent survey of breastfeeding mothers revealed that only 20% continue breastfeeding or to provide breast milk through pumping after 4 months, after which they switch to formula. When asked about reasons for stopping breastfeeding, the top three reasons were: going back to work, lack of support, and difficulties pumping. A socioeconomic study of the mothers revealed that women who choose to breastfeed for longest tend to have a higher level of education and come from more affluent backgrounds. Conversely, those mothers who breastfeed for the least amount of time tend to belong to minority groups and are from poorer backgrounds. It has been proposed that cultural differences also have a significant impact on the duration of breastfeeding.

Does the tone of the passage support breastfeeding?

A. Yes, the author states that breast milk is the only way to provide infants with sufficient nutrition.

B. No, the author states that formula is more nutritious.

C. No, the author implies that there are too many problems associated with breastfeeding.

D. Yes, the author talks positively about breastfeeding.

Correct Answer: D

In the first sentence, the author states that breast milk is the best form of nutrition and also demonstrates support for breastfeeding through the use of the word "unfortunately" at the start of the second sentence.

QUESTION 4

Although we know more about so-called Neanderthal men than about any other early population, their exact relation to present-day human beings remains unclear. Long considered sub-human, Neanderthals are now known to have been fully human. They walked erect, used fire, and made a variety of tools. They lived partly in the open and partly in caves. The Neanderthals are even thought to have been the first humans to bury their dead, a practice which has been interpreted as demonstrating the capacity for religious and abstract thought. The first monograph on Neanderthal anatomy, published by Marcelling Boule in 1913, presented a somewhat misleading picture. Boule took the Neanderthals\\' lowvaulted cranium and prominent brow ridges, their heavy musculature, and the apparent overdevelopment of certain joints as evidence of a prehuman physical appearance. In postulating for the Neanderthal such "primitive" characteristics as a stooping, bent-kneed posture, a rolling gait, and a forward-hanging head, Boule was a victim of the rudimentary state of anatomical science. Modern anthropologists recognize the Neanderthal bone structure as that of a creature whose bodily orientation and capacities were very similar to those of present-day human beings. The differences in the size and shape of the limbs, shoulder blades, and other body parts are simply adaptations which were necessary to handle the Neanderthal\\'s far more massive musculature. Current taxonomy considers the Neanderthals to have been fully human and thus designates them not as a separate species, Homo neanderthalensis, but as a subspecies of Homo sapiens: Homo sapiens neanderthalensis. The rise of the Neanderthals occurred over some 100,000 years -- a sufficient period to account for evolution of the specifically Neanderthal characteristics through free interbreeding over a broad geographical range. Fossil evidence suggests that the Neanderthals inhabited a vast area from Europe through the Middle East and into Central Asia from approximately 100,000 years ago until 35,000 years ago. Then, within a brief period of five to ten thousand years, they disappeared. Modern human, not found in Europe prior to about 33,000 years ago, thenceforth became the sole inhabitants of the region. Anthropologists do not believe that the Neanderthals evolved into modern human beings. Despite the similarities between Neanderthal and modern human anatomy, the differences are great enough that, among a population as broad-ranging as the Neanderthals, such an evolution could not have taken place in a period of only ten thousand years. Furthermore, no fossils of types intermediate between Neanderthals and moderns have been found. A major alternative hypothesis, advanced by E. Trinkaus and W.W. Howells, is that of localized evolution. Within a geographically concentrated population, free interbreeding could have produced far more pronounced genetic effects within a shorter time. Thus modern human could have evolved relatively quickly, either from Neanderthals or from some other ancestral type, in isolation from the main Neanderthal population. These humans may have migrated throughout the Neanderthal areas, where they displaced or absorbed the original inhabitants. One hypothesis suggests that these "modern" humans immigrated to Europe from the Middle East. No satisfactory explanation of why modern human beings replaced the Neanderthals has yet been found. Some have speculated that the modern humans wiped out the Neanderthals in warfare; however, there exists no archeological evidence of a hostile encounter. It has also been suggested that the Neanderthals failed to adapt to the onset of the last Ice Age; yet their thick bodies should have been heat-conserving and thus well-adapted to extreme cold. Finally, it is possible that the improved tools and hunting implements of the late Neanderthal period made the powerful Neanderthal physique less of an advantage than it had been previously. At the same time, the Neanderthals\\' need for a heavy diet to sustain this physique put them at a disadvantage compared to the less massive moderns. If this was the case, then it was improvements in human culture -- including some introduced by the Neanderthals themselves -- that made the Neanderthal obsolete.

It can be inferred from the passage that the rate of evolution is directly related to the:

A. concentration of the species population.

B. anatomical features of the species.

C. rate of environmental change.

D. adaptive capabilities of the species.

Correct Answer: A

According to the fourth paragraph, interbreeding in a concentrated population can produce more pronounced genetic effects in a shorter period of time than interbreeding in a sparser population would. From this it can be inferred that the rate

of evolution is directly related to the concentration of the species population (Choice A).

Changes in the anatomical features of a species (Choice B) may be a way to measure the rate of evolution, but anatomical features do not directly affect the rate of evolution. The rate of environmental change (Choice C) and the adaptive

capabilities of a species (Choice D) may both affect a species\\' survival, but they too do not speed evolution up in the way that concentrating the population can.

QUESTION 5

The rich analyses of Fernand Braudel and his fellow Annales historians have made significant contributions to historical theory and research. In a departure from traditional historical approaches, the Annales historians, assume (as do Marxists) that history cannot be limited to a simple recounting of conscious human actions, but must be understood in the context of forces and material conditions that underlie human behavior. Braudel was the first Annales historian to gain widespread support of the idea that history should synthesize data from various social sciences, especially economics, in order to provide a broader view of human societies over time (although Febvre and Bloch, founders of the Annales school, had originated this approach). Braudel conceived of history as the dynamic interaction of three temporalities. The first of these, the evenementielle, involved short-lived dramatic "events", such as battles, revolutions and the actions of great men, which had preoccupied traditional historians like Carlyle. Conjonctures was Braudel\\'s term for larger cyclical processes that might last up to half a century. The longue duree, a historical wave of great length, was for Braudel the most fascinating of the three temporalities. Here he focused on those aspects of everyday life that might remain relatively unchanged for centuries. What people ate, what they wore, their means and routes of travel -- for Braudel these things create "structures" which define the limits of potential social change for hundreds of years at a time. Braudel\\'s concept of the longue duree extended the perspective of historical space as well as time. Until the Annales school, historians had taken the juridical political unit the nation-state, duchy, or whatever as their starting point. Yet, when such enormous timespans are considered, geographical features may well have more significance for human populations than national borders. In his doctoral thesis, a seminal work on the Mediterranean during the reign of Philip II, Braudel treated the geohistory of the entire region as a "structure" that had exerted myriad influences on human lifeways since the first settlements on the shores of the Mediterranean Sea. And so the reader is given such arcane information as the list of products that came to Spanish shores from North Africa, the seasonal routes followed by Mediterranean sheep and their shepherds, and the cities where the best ship timber could be bought. Braudel has been faulted for the imprecision of his approach. With his Rabelaisian delight in concrete detail, Braudel vastly extended the realm of relevant phenomena; but this very achievement made it difficult to delimit the boundaries of observation, a task necessary to beginning any social investigation. Further, Braudel and other Annales historians minimize the differences among the social sciences. Nevertheless, the many similarly-designed studies aimed at both professional and popular audiences indicate that Braudel asked significant questions which traditional historians had overlooked.

Which of the following statements is most in keeping with the principles of Braudel\\'s work as described in the passage?

A. All written history is the history of social elites.

B. The most important task of historians is to define the limits of potential social change.

C. Those who ignore history are doomed to repeat it.

D. People\\'s historical actions are influenced by many factors that they may be unaware of.

Correct Answer: D

Choice D is the correct answer to this Application question because the author suggests in the first paragraph that one fundamental principle of Braudel\\'s work is that history must be understood in the context of forces and material conditions that underlying human behavior. So the assertion that historical actions are influenced by forces which individuals may be unaware of is perfectly consistent with Braudel\\'s principles. Choice A, on the other hand, is off-base because neither written history nor social elites are mentioned in the passage. Choice B is incorrect because defining

the limits of potential social change in the longue duree was but one aspect of Braudel\\'s work and certainly not the historian\\'s most important task. Finally, Choice C is a clich?and not particularly relevant to nor descriptive of Braudel\\'s analysis.