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## Exercise 10

Currently, the paramount problem in the field of biomaterials, the science of replacing diseased tissue with human-made implants, is control over the interface, or *Line* surface, between implanted biomaterials and living

- 5 tissues. The physical properties of most tissues can be matched by careful selection of raw materials: metals, ceramics, or several varieties of polymer materials. Even the requirement that biomaterials processed from these materials be nontoxic to host tissue can be met by
- 10 techniques derived from studying the reactions of tissue cultures to biomaterials or from short-term implants. But achieving necessary matches in physical properties across interfaces between living and non-living matter requires knowledge of which molecules control the bonding of
- 15 cells to each other—an area that we have not yet explored thoroughly. Although recent research has allowed us to stabilize the tissue-biomaterial interface by controlling either the chemical reactions or the microstructure of the biomaterials, our fundamental understanding of how
- 20 implant devices adhere to tissues remains woefully incomplete. (159 words)



- According to the passage, the major problem currently facing scientists in the field of biomaterials is
  - (A) assessing and regulating the bonding between host tissue and implants
  - (B) controlling the transfer of potentially toxic materials across the interface of tissue and implant
  - (C) discovering new materials from which to construct implant devices
  - (D) deciding in what situations implants are needed
  - (E) determining the importance of short-term implants to long-term stability of tissue implant interfaces
- 2. The passage suggests which of the following about the recent research mentioned in the last sentence?
  - (A) It has solved one set of problems but has created another.
  - (B) It has concentrated on secondary concerns but has ignored primary concerns.
  - (C) It has improved practical applications of biomaterial technology without providing a complete theoretical explanation of that improvement.
  - (D) It has thoroughly investigated properties of biomaterials but has paid little attention to relevant characteristics of human tissue.
  - (E) It has provided considerable information on short-term implant technology but little on long-term implant technology.



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Islamic law is a particularly instructive example of "sacred law." Islamic law is a phenomenon so different from all other forms of law—notwithstanding, of course, Line a considerable and inevitable number of coincidences with one or the other of them as far as subject matter and positive enactment are concerned—that its study is indispensable in order to appreciate adequately the full range of possible legal phenomena. Even the two other representatives of sacred law that are historically and geographically nearest to it, Jewish law and Roman Catholic canon law, are perceptibly different.

Both Jewish law and canon law are more uniform than Islamic law. Though historically there is a discernible break between Jewish law of the sovereign state of ancient Israel and of the Diaspora (the dispersion of Jewish people after the conquest of Israel), the spirit of the legal matter in later parts of the Old Testament is very close to that of the Talmud, one of the primary codifications of Jewish law in the Diaspora. Islam, on the other hand, represented a radical breakaway from the Arab paganism that preceded it; Islamic law is the result of an examination, from a religious angle, of legal subject matter that was far from uniform, comprising as it did the various components of the laws of pre-Islamic Arabia and numerous legal elements taken over from the non-Arab peoples of the conquered territories. All this was unified by being subjected to the same kind of religious scrutiny, the impact of which varied greatly, being almost nonexistent in some fields, and in others originating novel institutions. This central duality of legal subject matter and religious norm is additional to the variety of legal, ethical, and ritual rules that is typical of sacred law.

In its relation to the secular state, Islamic law differed from both Jewish and canon law. Jewish law was buttressed by the cohesion of the community, reinforced by pressure from outside; its rules are the direct expression of this feeling of cohesion, tending toward the accommodation of dissent. Canon and Islamic law, on the contrary, were dominated by the dualism of religion and state, where the state was not, in contrast with Judaism, an alien power but the political expression of the same religion. But the conflict between state and religion took different forms; in Christianity it appeared as the struggle for political power on the part of a tightly organized ecclesiastical hierarchy, and canon law was one of its political weapons. Islamic law, on the other hand, was never supported by an organized institution; consequently, there never developed an overt trial of strength. There

merely existed discordance between application of the 50 sacred law and many of the regulations framed by Islamic states; this antagonism varied according to place and time.









## For the following question, consider each of the choices separately and select all that apply

- 3. The passage provides information to answer which of the following questions EXCEPT?
- △ Does Islamic law depend on sources other than Arab legal principles?
- B What secular practices of Islamic states conflicted with Islamic law?
- ☐ Is Jewish law more uniform than canon law?
- 4. It can be inferred from the passage that the application of Islamic law in Islamic states has
  - (A) systematically been opposed by groups who believe it is contrary to their interests
  - (B) suffered irreparably from the lack of firm institutional backing
  - (C) frequently been at odds with the legal activity of government institutions
  - (D) remained unaffected by the political forces operating alongside it
  - (E) benefited from the fact that it never experienced a direct confrontation with the state



- 5. Which of the following most accurately describes the organization of the passage?
  - (A) A universal principle is advanced and then discussed in relation to a particular historical phenomenon.
  - (B) A methodological innovation is suggested and then examples of its efficacy are provided.
  - (C) A traditional interpretation is questioned and then modified to include new data.
  - (D) A general opinion is expressed and then supportive illustrations are advanced.
  - (E) A controversial viewpoint is presented and then both supportive evidence and contradictory evidence are cited.
- 6. The passage suggests that canon law differs from Islamic law in that only canon law
  - (A) contains prescriptions that nonsacred legal systems might regard as properly legal
  - (B) concerns itself with the duties of a person in regard to the community as a whole
  - (C) was affected by the tension of the conflict between religion and state
  - (D) developed in a political environment that did not challenge its fundamental existence
  - (E) played a role in the direct confrontation between institutions vying for power





If a supernova (the explosion of a massive star) triggered star formation from dense clouds of gas and dust, and if the most massive star to be formed from the cloud evolved into a supernova and triggered a new round of star formation, and so on, then a chain of star-forming regions would result. If many such chains were created in a differentially rotating galaxy, the distribution of stars would resemble the observed distribute in a spiral galaxy.

This line of reasoning underlies an exciting new theory of spiral-galaxy structure. A computer simulation based on this theory has reproduced the appearance of many spiral galaxies without assuming an underlying density wave, the hallmark of the most widely accepted theory of the large-scale structure of spiral galaxies. That theory maintains that a density wave of spiral form sweeps through the central plane of a galaxy, compressing clouds of gas and dust, which collapse into stars that form a spiral pattern. (160 words)

- 7. The primary purpose of the passage is to
  - (A) describe what results when a supernova triggers the creation of chains of star-forming regions
  - (B) propose a modification in the most widely accepted theory of spiral-galaxy structure
  - (C) compare and contrast the roles of clouds of gas and dust in two theories of spiral-galaxy structure
  - (D) describe a new theory of spiral-galaxy structure and contrast it with the most widely accepted theory
  - (E) describe a new theory of spiral-galaxy structure and discuss a reason why it is inferior to the most widely accepted theory

- 8. The passage implies that, according to the new theory of spiral-galaxy structure, a spiral galaxy can be created by supernovas when the supernovas are
  - (A) producing an underlying density wave
  - (B) affected by a density wave of spiral form
  - (C) distributed in a spiral pattern
  - (D) located in the central plane of a galaxy
  - (E) located in a differentially rotating galaxy
- 9. Which of the following, if true, would most discredit the new theory as described in the passage?
  - (A)The exact mechanism by which a star becomes a supernova is not yet completely known and may even differ for different stars.
  - (B) Chains of star-forming regions like those postulated in the new theory have been observed in the vicinity of dense clouds of gas and dust.
  - (C) The most massive stars formed from supernova explosions are unlikely to evolve into supernovas.
  - (D) Computer simulations of supernovas provide a poor picture of what occurs just before a supernova explosion.
  - (E) A density wave cannot compress clouds of gas and dust to a density high enough to create a star.







The fact that Black people in the English colonies of North America were never treated as the equals of White people has important ramifications. If from the *Line* outset Black people were discriminated against, then

- Line outset Black people were discriminated against, then

  legal slavery in the 1660's should be viewed as a
  reflection and an extension of racial prejudice rather
  than, as many historians including Oscar and Mary
  Handlin have argued, the cause of prejudice. In
  addition, the existence of discrimination before the
  advent of legal slavery offers a further explanation for
  the harsher treatment of Black slaves in North than in
  South America. Freyre and Tannenbaum have rightly
  argued that the lack of certain traditions in North
- America—such as a Roman conception of slavery and a Roman Catholic emphasis on equality—explains why the treatment of Black slaves was more severe there than in the Spanish and Portuguese colonies of South America. But this cannot be the whole explanation since it is merely negative, based only on a lack of something. A more compelling explanation is that the
  - something. A more compelling explanation is that the early and sometimes extreme racial discrimination in the English colonies helped determine the particular nature of the slavery that followed.

(192 words)

## For the following question, consider each of the choices separately and select all that apply

- 10. According to the passage, the Handlins have NOT argued which of the following about the relationship between racial prejudice and the institution of legal slavery in the English colonies of North America?
- A Racial prejudice and the institution of slavery arose simultaneously.
- B The source of racial prejudice was the institution of slavery.
- ☐ Although existing in a lesser form before the 1660's, racial prejudice increased sharply after slavery was legalized.

- 11. The passage suggests that the existence of a Roman conception of slavery in Spanish and Portuguese colonies had the effect of
  - (A) extending rather than causing racial prejudice in these colonies
  - (B) hastening the legalization of slavery in these colonies
  - (C) mitigating some of the conditions of slavery for Black people in these colonies
  - (D) delaying the introduction of slavery into the English colonies
  - (E) bringing about an improvement in the treatment of Black slaves in the English colonies
- 12. The author considers the explanation put forward by Freyre and Tannenbaum for the treatment accorded Black slaves in the English colonies of North America to be
  - (A) ambitious but misguided
  - (B) valid but limited
  - (C) popular but suspect
  - (D) anachronistic and controversial
  - (E) premature and illogical





