

Exercise 29

Analyzing the physics of dance can add fundamentally to a dancer's skill. Although dancers seldom see themselves totally in physical terms -- as body mass moving through space under the influence of well-known forces and obeying physical laws -- neither can they afford to ignore the physics of movement. Some movements involving primarily vertical or horizontal motions of the body as a whole, in which rotations can be ignored, can be studied using simple equations of linear motion in three dimensions. However, rotational motions require more complex approaches that involve analyses of the way the body's mass is distributed, the axes of rotation involved in different types of movement, and the sources of the forces that produce the rotational movement. (120 words)

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1.The primary purpose of the passage is to

- (A) initiate a debate over two approaches to analyzing a field of study
- (B) describe how one field of knowledge can be applied to another field
- (C) point out the contradictions between two distinct theories
- (D) Define and elaborate on an accepted scientific principle
- (E) discuss the application of a new theory within a new setting

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

2.The author mentions all of the following as contributing to an understanding of the physics of dance

- A analyses of the way in which the body's mass is distributed
- B equations of linear motion in three dimensions
- C analyses of the sources that produce rotational motions

3. Hastings' contracture is a disorder of the connective tissue in one or both hands, most commonly causing loss of mobility. A survey of thousands of medical-insurance claims found that over 30 percent of people who had one hand operated on for Hastings'

contracture underwent surgery a second time for this disorder within three years. Clearly, therefore, a single surgical treatment of Hastings' contracture is often ineffective at providing long-term correction of the disorder.

Which of the following, if true, most seriously weakens the argument?

- (A) The medical-insurance claims did not specify whether the surgery was on the patient's right or left hand.
- (B) The surgical techniques used to treat Hastings' contracture are identical to those used successfully to treat certain work-related injuries to the hand.
- (C) A separate survey found that 90 percent of patients operated on for Hastings' contracture report increased hand mobility within one month after the surgery.
- (D) All of the patients in the survey were required by their insurance companies to seek a second opinion from a qualified surgeon before undergoing the operation.
- (E) Many people who have Hastings' contracture choose to tolerate its effects rather than undergo the risks of surgery.

The Fourteenth Amendment to the United States Constitution, ratified in 1868, prohibits state governments from denying citizens the "equal protection of the laws." Although precisely what the framers of the amendment meant by this equal protection clause remains unclear, all interpreters agree that the framers' immediate objective was to provide a constitutional warrant for the Civil Rights Act of 1866, which guaranteed the citizenship of all persons born in the United States and subject to United States jurisdiction. This declaration, which was echoed in the text of the Fourteenth Amendment, was designed primarily to counter the Supreme Court's ruling in *Dred Scott v. Sandford* that Black people in the United States could be denied citizenship. The act was vetoed by President Andrew Johnson, who argued that the Thirteenth Amendment, which abolished slavery, did not provide Congress with the authority to extend citizenship and equal protection to the freed slaves.

Although Congress promptly overrode Johnson's veto, supporters of the act sought to ensure its constitutional foundations with the passage of the Fourteenth Amendment.
(172 words)

4. The author implies that the Fourteenth Amendment might not have been enacted if

- (A) Congress' authority with regard to legislating civil rights had not been challenged
- (B) the framers had anticipated the Supreme Court's ruling in *Brown v. Board of Education*
- (C) the framers had believed that it would be used in deciding cases of discrimination involving non-racial groups
- (D) most state governments had been willing to protect citizens' civil rights
- (E) its essential elements had not been implicit in the Thirteenth Amendment

5. According to the passage, which of the following most accurately indicates the sequence of the events listed below ?

- I. Civil Rights Act of 1866
- II. *Dred Scott v. Sandford*
- III. Fourteenth Amendment
- IV. Veto by President Johnson

- (A) I, II, III, IV
- (B) I, IV, II, III
- (C) I, IV, III, II
- (D) II, I, IV, III
- (E) III, II, I, IV

6. In the context in which it appears, "overrode" most nearly means

- A trampled
- B extended
- C annulled
- D neutralized
- E compromised

阅读 1 : 参考翻译 :

译文:

分析舞蹈的物理原理能从根本上增加一个舞者的技巧。尽管舞者很少完全从物理过程面审视自己——如身体在空间的移动是受众所周知的力的影响并遵循物理定律的,但谁也能忽视运动的物理原则。例如,无论一个舞者多么希望从地上跃起再开始转身,角动量的守恒定律绝对不允许这一动作。

一些运动,主要包括整个身体的垂直或水平运动(旋转此时可被忽略),可在三维空间里简单的线性方程来研究。但旋转运动要求更为复杂的方法,包括身体重力如何分解的分析、同种类运动旋转的中心轴及产生旋转运动的力量源泉的分析。

文章结构:

结论解释型; 首句为 Topic Sentence。

重点词汇:

vertical motion 垂直运动

linear motion 线性运动

horizontal motion 水平运动

重要背景:

角动量守恒定律:内容:角动量是旋转物体的转动惯量和角速度的乘积。从牛顿第二定律可知:力=质量×加速度,其中质量对某物体来说是恒定值(仅在经典力学中讨论)。故当外力为零时,加速度为零;加速度为零,速度 V 就不变,所以动量 MV 就守恒。

实例:1)花样滑冰运动员,在旋转时身体先成“大”字,登冰加速旋转,然后单脚支冰许多圈,在强弩之末时,突然将双手上举合掌,一条腿收回,靠拢支撑的那条腿,全身成蜡烛状,此时转动惯量突然变小,转速可以突然神奇地加快。

2)跳水或自由体操运动员,以改变身体形状控制节奏,身体舒展放开(转动惯量大),则转动慢;反之,如将身体缩成一团,可快速翻滚 2 周至 3 周半。

Q1 physics 在 dance 中的应用。选 B;

Q2 对应文中三句话, ABC.

阅读 2:

论据:一个关于医疗保险的调查称:30%的一只手的患者三年内都需要第二次进行这个治疗;

结论:这个治疗从长期看是无效的;

题目:哪个选项削弱了文章结论?

选项 A: 如果报告中没说两次是否为同一只手,即都是左手或者都是右手,就很大程度质疑了结论;

Many organisms are capable of altering their habitat significantly, sometimes limiting their own growth. The influence of the biological component of an ecosystem is often greater in fresh waters than in marine or terrestrial systems, because of the small size of many freshwater bodies. Many of the important effects of organisms are

related to their physiology, especially growth and respiration. By their growth many species can deplete essential nutrients within the system, thus limiting their own growth or that of other species. Lund has demonstrated that in Lake Windermere the alga *Asterionella* is unable to grow in conditions that it itself has created. Once a year, in the spring, this plant starts to grow rapidly in the lake, using up so much silica from the water that by late spring there is no longer enough to maintain its own growth. The population decreases dramatically as a result. (147 words)

7. It can be inferred from the passage that which of the followings is true about *Asterionella* plants in Lake Windermere?

- (A) They are not present except in early spring.
- (B) They contribute silica to the waters as they grow.
- (C) They are food for other organisms.
- (D) They form a silica-rich layer on the lake bottom.
- (E) Their growth peaks in the spring.

8. Select the sentence in the passage that indicates certain causes of the alteration of organisms to their habitat.

阅读 1 : 来自老 G 长文章删减 ;

老 G 译文如下 :

译文:

1868 年批准的美国宪法第 14 条修正案禁止州政府剥夺公民的“平等的法律保护”。尽管制定此平等保护的修正案的确切意图仍不明了,但所有的解释均认同这点:即制定者的直接目的是为 1866 年的《民权法》提供宪法保障,而《民权法》则保证所有在美国出生并受美国司法管辖的人的公民权。这一后来又在第 14 条修正案中得以体现的宣言,主旨是反对最高法院在“Dred Scott 诉 Sandford”中判定的美国黑人可能被剥夺公民权这一裁决。《民权法》被总统安德鲁·约翰逊所否决,他认为,第 13 条修正案废除了奴隶制,但它并没有提供给国会权力去把公民权与平等保护权扩展到已自由的奴隶身上。尽管国会又很快推翻了约翰逊总统的否决,但《民权法》支持者又试图确立其宪法基础,这就有了第 14 条修正案的通过。

修正案的宽泛粗略的语言有力地表明,其制定者写入宪法的不是是一张具体公民权利的细目,而是一个关于平等公民权的基本信条,它禁止有组织的团体将任何个人当作下等人来对待。然而,此修正案存在的最初 80 年,最高法院对它的解释却背离了平等这一信念。例如,在 1883 年的“民权诉讼案”中,最高法院创造了“政府行为”限制一说,宣称公共旅馆和其他企业、商业所有者对其服务中的种族隔离的“私人”决定,不在第 14 条修正案中法律之下的平等保护的适用范围。

的适用范围。

第二次世界大战以后,一种关于平等保护主张的法律风气愈演愈烈,这一形势在最高裁决“布朗诉教育局案”中达到高潮,即设置种族分离学校违反了第 14 条修正案中的平等一条。最高法院的两种信条扩展了第 14 条修正案的适用范围。第一,最高法院要求对“怀疑分类”的立法进行特别严格的详审,“怀疑分类”是指一种群体被采取有可能是基于的原因而进行的歧视。这种信条已放宽了第 14 条修正案的适用范围,使其也适用于其他种族形式的歧视,因为尽管一些法庭拒绝将各种基于种族以外原因的立法定为违宪,但大人已接受至少有一些非种族歧视,特别是性别歧视,是“值得怀疑的”,并应受法庭的严格审查。第二,最高法院放松了第 14 条修正案中的政府行为限制,在其适用范围内增加了个人行许多新形式。

文章结构: 结论解释型;

Q4:

作者暗示第 14 条修正案如果怎样,就不会被制订:

- 原文: 约翰逊总统否决了民权法案,国会为给该法案寻求宪法基础,制订了该法案。取非得; A 正确。国会对民权的立法没有被提出挑战。符合上述推理。
- B. 制定者已预见了最高法院对“布朗诉教育局案”的判决。无。
- C. 制定者已相信修正案会被用于非种族歧视的裁决。无。
- D. 大多数州政府愿意保护公民权利。无关。
- E. 修正案的必要构成并没有暗含在第 13 条修正案中。无关。

Q5:

根据文章,下列事件正确顺序为:

1. 1866 年的民权法案
2. Dred Scott 起诉 Sardford 一案
3. 第 14 条修正案
4. 总统约翰逊的否决

见第一段,正确顺序为:2143。

∴D 正确。

Q6: 根据 override 出现的那个句子: Although Congress promptly overrode Johnson's veto, 前文知道 Congress 和 Johnson 是对立关系, 所以 override 承接前文关系肯定是不同意的, 选 C。

阅读 2: 结论解释型;

文章翻译:

译文:

生物体确实深受环境影响,但同样重要的是很多生物体也能有效地改变其生存环境,有时这种改变也能限制其自身成长。生态系统中生物元素(对环境)的影响在淡水中比在海洋中或陆地上强,因为淡水系统的水体很小。生物体的重要影响中很多与其生理现象相关,尤其是生长与呼吸。在成长中,很多物种耗去了生态系统内必要的营养,因此限制了自己与其他物种的生长。Lund 已证实在 Windermere 湖中 A 水藻不能在自己创造的条件中生长。每年春天,这种植物开始在湖区快速生长,消耗了水中的大量氧化硅,晚春时节,就再也没有足够的物质来维系它们自身的成长了,结果是数量急剧下降。

Q7: 从文中可推断,关于 Windermere 湖的 A 植物,哪一判断正确:

- A. 它们只在早春出现。反,晚春减少,但仍有。
- B. 其长大后,为水域提供氧化硅。反,吸收硅化物。
- C. 它们是其它生物体的食物。无。
- D. 它们在湖底形成了一个富含氧化硅的层面。无。
- E. 它们的生长在春天达到顶点。正确,早春猛长,晚春衰落。

Q8:

问的是 cause 而不是 effort, 所以正确答案是 Many of the important effects of organisms are related to their physiology, especially growth and respiration.

Design courses should be an essential element in engineering curricula. Because perceptive processes are not assumed to entail "hard thinking," nonverbal thought is sometimes seen as a primitive stage in the development of cognitive processes and inferior to verbal or mathematical thought. But it is paradoxical that when the staff of the Historic American Engineering Record wished to have drawings made of machines and isometric views of

industrial processes for its historical record of American engineering, the only college students with the requisite abilities were not engineering students, but rather students attending architectural schools.

If courses in design, which in a strongly analytical engineering curriculum provide the background required for practical problem-solving, are not provided, we can expect to encounter silly but costly errors occurring in advanced engineering systems. For example, early models of high-speed railroad cars loaded with sophisticated controls were unable to operate in a snowstorm because a fan sucked snow into the electrical system. (157 words)

9.The author calls the predicament faced by the Historic American Engineering Record "paradoxical" most probably because

- (A) the publication needed drawings that its own staff could not make
- (B) architectural schools offered but did not require engineering design courses for their students
- (C) college students were qualified to make the drawings while practicing engineers were not
- (D) the drawings needed were so complicated that even students in architectural schools had difficulty making them.
- (E) engineering students were not trained to make the type of drawings needed to record the development of their own discipline

10.The author uses the example of the early models of high-speed railroad cars primarily to

- (A) weaken the argument that modern engineering systems have major defects because of an absence of design courses in engineering curricula
- (B) support the thesis that the number of errors in modern engineering systems is likely to increase
- (C) illustrate the idea that courses in design are the most effective means for reducing the cost of designing engineering systems
- (D) support the contention that a lack of attention to the nonscientific aspects of design results in poor conceptualization by engineers

(E) weaken the proposition that mathematics is a necessary part of the study of design

阅读 1：参考翻译：

因此设计课程应该成为工程课程中的基本成份。非语言思维，这一设计的核心机制，包括了感受这一属于艺术家的而非科学家的惯用手段。因为人们认为感受的过程不需要“硬思维”，非语言思维被视为认知过程发展的一个原始阶段而且比语言和数学思维差。但令人感到自相矛盾的是，当《美国工程历史名录》的工作人员希望得到为其美国工程历史记录而绘制的机器图和等比例图时，唯一具有所需技能的大学生不是工程学大学生，而是就读于建筑学院的大学生。

如果不能开设设计课程(它能在一个高度分析性工程学课程体系中提供解决实际问题的背景知识)，我们就会在先进的工程系统中遇到愚蠢而同时会导致极大损失的错误。比如，装载了精密控制设备的早期高速铁路车辆模型不能在暴风雪中正常运行，原因是一个风扇将雪吸入到电子系统中。干扰着自动控制系统的荒唐的随机故障不是轻微的失常；它们是一种混乱的反映，人们认为这种混乱主要在设计数学方面的问题时就会产生。

重点词汇：

artisan [ˌɑːtɪˈzæn] n. 工匠，手艺人

pyramid [ˈpɪrəˌmɪd] n. 金字塔

cathedral [ˌkæθɪˈdrəl] n. 大教堂，教区总教堂

thermodynamics [ˈθɜːməˌdaɪˈnæmiks] n. 热力学

diesel engine 柴油发动机

valve [vælv] n. 阀门，活门

piston [ˈpɪstən] n. 塞子，活塞

diameter [daɪˈæmɪtə] n. 对径，直径

curriculum [kəˈrɪkjʊləm] n. 课程设置

stock-in-trade (惯用的)手段，办法，技巧

entail [ɪnˈteɪl] v. 使必要，使负担

cognitive process 认知过程

absurd [əˈbɜːd] a. 荒唐的

aberration [æbəˈreɪʃən] n. 犯规，越轨

chaos [ˈkeɪɒs] n. 大混乱

Q9：

作者称《美国工程学名录》所面临的困境为 paradoxical 最可能是因为：

该词的含义，见第一部分第 56 页。此处：正常推理，本专业的人画本专业的图画，总会比外专业的人强。可学工程的画工程图，反而不如学建筑的，看着很矛盾。但作者意思是：学工程的没有上过设计课，所以 nonverbal thinking 没有得到培养，而学建筑的相反，所以出现了看着很古怪的现象。

∴ E 正确。工程学校的学生没有被训练去绘制记录他们自己学科的发展的图画。

A. 该出版物需要由它自己的全体职员不能做出的图片。是学生画不好。

B. 建筑学校主动提供，但不要求必修工程设计课程。

C. 大学生被训练画图，而工程师没有。

D. 被需要的图片是如此复杂以至于建筑学校的学生制造它都很困难。

均无。

Q10 :

作者运用早期高速铁路汽车的例子主要是为了：

in order to 的变体。定位,原文此例的说明,前后都有。前:L44~48,如果设计课,一门能以其高度的分析性来为学生们提供将来解决实际问题的根底的课得不到开设,我们将在工程系统中遭遇愚蠢而又代价高昂的错误。后:刚才 26 题的内容。

∴ D 正确。支持观点:缺乏非科学思维会导致设计中的缺乏感悟力。

A. 削弱了观点:工程设计的主要的短处,是因为在工程课程中缺乏设计课程。反,该例子正好支持该观点。

B. 支持了一个论题,现代工业系统中错误的数量很可能会增长。无。

C. 说明了一个观点即设计课程是最有效的减少设计错误的方式。most 推不出。

E. 驳斥数学应成为设计课一部分的观点。无关。