

奈良県立医科大学 推薦

平成 28 年 度

試 験 問 題 ①

学 科 試 験

(9時～12時)

【注 意】

1. 試験開始の合図があるまで、この問題冊子の中をみてはならない。
2. 試験教科、試験科目、ページ、解答用紙および選択方法は下表のとおりである。

教 科	科 目	ペー ジ	解 答 用 紙 数	選 択 方 法
数 学	数 学	1～12	1 枚	数学、英語は必須解答とする。 理科は左の3科目のうちから1科目を選択せよ。
英 語	英 語	13～16	1 枚	
理 科	化 学	17～28	2 枚	
	生 物	29～42	3 枚	
	物 理	43～52	1 枚	

3. 監督者の指示に従って、選択しない理科科目を含む全解答用紙(8枚)に受験番号と選択科目(理科のみ)を記入せよ。
 - ① 受験番号欄に受験番号を記入せよ。
 - ② 理科は選択科目記入欄に選択する1科目を○印で示せ。

上記①、②の記入がないもの、および理科2科目または理科3科目選択した場合は答案全部を無効とする。
4. 解答はすべて解答用紙の対応する場所に記入せよ。
5. 問題冊子の余白を使って、計算等を行ってもよい。
6. 試験開始後、問題冊子の印刷不鮮明、ページの落丁・乱丁および解答用紙の汚れ等に気づいた場合は、手を挙げて監督者に知らせよ。
7. 解答用紙はいずれのページも切り離してはならない。
8. 解答用紙は持ち帰ってはならない。問題冊子は持ち帰ってよい。

英 語

次の英文を読んで、設問に答えよ。（*印の語には注がある。）

I had one of the most satisfying, revealing experiences of my career while teaching flight instructors in the Israeli Air Force* about the psychology of effective training. I was telling them about an important principle of skill training: (1)rewards for improved performance work better than punishment of mistakes. This proposition is supported by much evidence from research on pigeons, rats, humans, and other animals.

When I finished my enthusiastic speech, one of the most experienced instructors in the group raised his hand and made a short speech of his own. He began by agreeing that rewarding improved performance might be good for the birds, but he denied that it was best for flight cadets*. This is what he said: “On many occasions I have praised flight cadets for clean completion of some aerobatic maneuver*. The next time they try the same maneuver they usually do worse. On the other hand, I have often screamed into a cadet’s earphone for bad performance, and in general he does better on his next try. So please don’t tell us that reward works and punishment does not, because (2)the opposite is the case.”

(3)This was a joyous moment of insight, when I saw in a new light a principle of statistics that I had been teaching for years. (4)The instructor was right – but he was also completely wrong! His observation was insightful and correct: occasions on which he praised a performance were likely to be followed by a disappointing performance, and punishments were typically followed by an improvement. But the inference* he had drawn about the effectiveness of reward and punishment was completely off the mark*. What he had observed is known as regression to the mean, which in that case was due to random fluctuations* in the quality of performance. Naturally, he praised only a cadet whose performance was far better than average. But the cadet was probably just lucky on that particular attempt and therefore (5)likely to deteriorate regardless of whether or not he was praised. Similarly, the instructor would shout into a cadet’s earphones only when the cadet’s performance was unusually bad and therefore likely

to improve regardless of what the instructor did. The instructor had attached a causal interpretation* to the inevitable fluctuations of a random process.

The challenge called for a response, but a lesson in the algebra of prediction would not be enthusiastically received. (6)Instead, I used chalk to mark a target on the floor. I asked every officer in the room to turn his back to the target and throw two coins at it in immediate succession, without looking. We measured the distances from the target and wrote the two results of each officer on the blackboard. Then we rewrote the results in order, from the best to the worst performance on the first try. It was apparent that most (but not all) of those who had done best the first time deteriorated on their second try, and those who had done poorly on the first attempt generally improved. I pointed out to the instructors that what they saw on the board coincided with what we had heard about the performance of aerobic maneuvers on successive attempts: poor performance was typically followed by improvement and good performance by deterioration, without any help from either praise or punishment.

(7)その日私が発見したことは、飛行教官は不運な偶然性の罠にはまっていたということである。すなわち、実際は懲罰には効果がなかったにもかかわらず、実演がまずかった時に練習生を罰したからこそ、ほとんどの場合次回の改良という報酬（成果）が得られたのだと、彼らは錯覚していた。

注

Israeli Air Force* イスラエル空軍

flight cadets* 航空機操縦士練習生

aerobatic maneuver* 曲技飛行（の練習）

inference* 推論 [論理的推測から得られた結論]

off the mark* 的外れ

random fluctuations* 無作為変動 [特定の原因なしに発生する変動]

causal interpretation* 因果関係を前提とした解釈

設問

1. 下線部 (1) について、筆者の意図するところを日本語でわかりやすく述べよ。
2. 下線部 (2) の指す内容を日本語で具体的に記せ。
3. 下線部 (3) を和訳せよ。
4. 下線部 (4) について、教官の主張がどの点で「正しく」、どの点で「間違っている」というのか、日本語で具体的に記せ。
5. 下線部 (5) は、どのような状況で何が発生するというのか、日本語で具体的に記せ。
6. 下線部 (6) から始まってこの段落の終わりまでに記されている、筆者が実行したことを、125字以内の日本語で要約せよ。
7. 下線部 (7) を英訳せよ。

[下書き用紙]