2005 Psychology GA1: Written examination

GENERAL COMMENTS

Students generally performed well on the June paper, and the results, on average, were a little higher than for Examination 1 in 2004. This increase is believed to be due to the use of slightly less sophisticated terminology in some of the questions in the short-answer section.

In the multiple-choice section all three areas were well answered, although the mean performances for 'Visual perception' and 'States of consciousness' were slightly lower than for 'Brain and nervous system'. As in previous years, students did not perform as well on the short-answer questions. This was often because of a lack of precision and completeness in descriptions and definitions, failure to refer to appropriate psychological information, or failure to provide appropriate examples in their answers even when examples were specifically requested in the question.

Teachers had clearly instructed and directed students' attention to the key knowledge and skills in the Study Design. In general, students demonstrated good knowledge and understanding of the curriculum, although, as in previous years, many performed below their capabilities by not addressing all aspects of the question in their answers. For example, when required to describe and explain in Question 2b 'If Mario's corpus callosum were completely severed, what would be the best way for him to demonstrate what he had seen? Why?', many students gave a description of a possible procedure but no explanation. Students need to read the short-answer questions very carefully and then check their answer against the question's requirements. Another example was in Question 14a in which students were asked to list '…**three** problems with her sleep pattern that may have led to this diagnosis'; many students included symptoms such as 'feeling fatigued the next day', 'droopy eyelids' or 'difficulty completing simple tasks' – clearly these could not earn marks as they were not problems with her **sleep pattern**.

Marking policies

Short-answer questions worth one mark usually required one or sometimes two key terms and/or pieces of information; questions worth two marks always required two key terms and/or pieces of information. Three-mark questions required three terms and/or pieces of information.

In some cases, two distinct terms and/or statements were required for each mark (for example, Questions 2b, 5a and 13b) and this was made clear in the question stem. Within these guidelines, assessors judged students' knowledge and understanding based on the answers provided.

SPECIFIC INFORMATION

Multiple-choice questions

This section of the paper was very well answered with only three questions resulting in a correct response rate of less than 50%. These questions, along with some other moderately difficult ones, are discussed below.

The table below indicates the number of students who chose each option. The correct answer is indicated by shading.

Question	% A	% B	% C	% D	Comments
Area of Study 1 – Brain and nervous system					
1	1	1	98	0	
2	8	9	81	2	
3	1	90	1	8	
4	7	1	89	2	
5	74	10	3	13	
6	1	5	89	5	
7	62	22	8	9	A significant minority of students chose 'completing a jigsaw puzzle' (option B) as their answer. Although the right hemisphere may have some part to play in the creative aspect of poetry, ascribing meaning, finding the correct words and expressing them are very dominant left hemisphere functions.
8	72	3	3	21	
9	5	74	8	12	
10	12	5	73	9	
11	21	21	55	3	
12	2	93	5	0	
13	2	5	93	1	
14	2	17	2	80	
15	9	9	5	78	
16	3	29	30	38	Although this may not have been addressed specifically in the teaching of the general adaptation syndrome, the correct answer is clearly option D. A number of students chose the incorrect alternative of option B, which should have been eliminated by the nomination of 'long-term stress' in the stem of the question.
17	97	1	1	1	
18	1	83	14	1	
Area of Study 2 – Visual perception					
19	5	83	10	2	
20	4	1	4	90	
21	9	72	13	5	
22	22	62	12	4	
23	27	1	4	68	The fact that over 25% of students chose option A as their answer demonstrated that the concept of retinal disparity was not well understood. This was reinforced by responses to Section B, Question 9 (see below).
24	4	3	2	91	
25	15	3	2	81	
26	22	14	56	9	
27	11	11	2	77	
28	6	12	7	75	
29	81	17	1	0	
30	6	35	2	57	Option D was the **most correct** response.
31	11	1	3	85	
Area of Study 3 – States of consciousness					
32	1	96	1	2	
33	4	6	87	3	
34	11	9	77	2	
35	78	7	6	9	
36	2	5	18	75	
37	3	10	78	8	
38	2	26	71	1	There is little change in a person's ability to complete **complex** tasks (option B) – **simple** tasks are more difficult to complete after sleep deprivation.

Question	% A	% B	% C	% D	Comments
39	6	90	1	3	
40	87	13	0	0	
41	24	13	9	53	
42	4	1	31	64	REM paralysis indicates that option D was the preferred response.
43	36	7	12	44	The participants are matched only on variables that have the potential to confound results. This does **not** preclude wide generalisation of findings as indicated by option A.
44	49	14	27	10	A significant number of students chose the incorrect options B or C for this question. This clearly indicates that there was widespread misunderstanding about the way in which a placebo (control) group is used in an experiment.

Short-answer questions

In this section, the most consistent problem was the tendency of students to give a broad response on the general topic of the question, without addressing what the wording of the question specifically required.

In the information below possible answers to questions are given, followed, where appropriate, by comments about the question or the way in which the question was answered.

Area of Study 1 – Brain and nervous system

This section was generally well answered. Hemispheric specialisation appeared to be better understood than in the past. Most students adequately explained the implications of severing the corpus callosum, showing a real improvement on responses to the 2004 examination.

Question 1a

Marks	0	1	Average
%	21	79	**0.8**

Cerebral cortex.

'Cortex' alone was not sufficient to gain a mark.

Question 1b

Marks	0	1	2	Average
%	39	28	33	**1.0**

Functions include:

- primary sensory functions/processing of sensory information
- motor coordination and control/processing of motor information
- 'higher mental processes' of language, thinking and problem solving
- facilitating most of the integrative, coordinated behaviours
- information processing within lobes, including perception, cognition and memory
- integration of information among lobes in association areas
- personality.

This question was not well answered. Because of the wording of the question, one mark was awarded for a statement explaining the purpose of the grooving, such as 'the function of the furrowing and grooving is to increase the surface area (or volume) – thereby increasing blood flow/oxygen or energy supply/number of neurons'.

Question 2a

Marks	0	1	Average
%	12	88	**0.9**

The right hemisphere.

This question, which assessed knowledge of hemispheric specialisation in relation to visual processing, was well answered.

Question 2b

Marks	0	1	2	Average
%	49	37	14	**0.7**

- Mario would be able to select or point to an apple (or picture of an apple) with his left hand if given the opportunity (but would not be able to verbally say 'apple') **or**
- Mario would be able to **draw a picture** representing an apple with his left hand.

This is because the image would go to the right hemisphere, which is responsible for non-verbal processing and motor movement on the left side of the body. It would not be transferred to the left hemisphere, which is responsible for verbal processing and motor movement on the right side of the body.

Students were given one mark for an appropriate method and one mark for the explanation. It was surprising that almost 50% of students did not score any marks, even though 88% knew which hemisphere would process the visual information. Clearly teachers need to emphasise all features of hemispheric specialisation.

Question 3a

Marks	0	1	2	Average
%	28	25	47	**1.2**

Electrical stimulation (or magnetic, chemical or physical stimulation) of the brain occurs when a stimulus is delivered which stimulates (excites or inhibits) neurons in a specific area on the cerebral cortex. The patient can then report on their experience, and/or reactions can be noted.

This has made the following contributions:

- enabled identification of particular functions within specific areas of the brain
- allowed surface mapping of sensory and motor cortices
- enabled hemispheric specialisation for different functions
- given a general idea of localisation of function
- provided information on the location of responses such as sensory, motor, hunger, thirst, sleep and emotional responses.

This is a new dot-point in the Study Design which had obviously been well covered in teaching programs.

Question 3b

Marks	0	1	Average
%	42	58	**0.6**

Limitations include:

- since brain structure differs from person to person, previous findings can only give a general indication about location of function, not specific information about an individual. The results cannot be generalised
- lacks precision
- an invasive method
- requires expert administration
- all surgery imposes health risks
- usually used with people undergoing brain surgery for other reasons, therefore it is difficult to generalise findings to a 'healthy' population
- 'opportunistic' rather than random sampling limits generalisation to the population.

Other appropriate disadvantages were also accepted.

Question 4a

Marks	0	1	Average
%	33	67	**0.7**

Either of:

- the PET scan shows which areas of the brain are active while certain tasks are performed

- the PET scan gives information about brain functioning.

This question was generally well answered.

Question 4b

Marks	0	1	Average
%	43	57	**0.6**

Advantages of PET include:

- CT is static while PET shows the brain in action
- CT shows structural features and location of damage while PET shows functional areas
- PET is more sensitive than CT in detecting areas of brain damage
- unlike CT scans, PET scans are colour-coded, which aids interpretation.

This question demanded a specific comparison; however, many students mistakenly compared PET scans with other forms of brain-imaging.

Question 4c

Marks	0	1	Average
%	69	31	**0.3**

Differences include:

- fMRI uses a magnetic field to create a three dimensional image of the brain where any two dimensional slice can be selected, and also **displays brain activity on the screen**
- MRI shows only the structure of the brain.

Where students had identified the differences in Questions 4a and/or 4b as being largely a contrast between imaging techniques showing function and those showing only structure, many avoided using the same contrast in Question 4c. However, students should note that each question is discrete and independent and it was acceptable to use the same contrast in the different comparisons of the various parts of this question.

Question 5a

Marks	0	1	Average
%	10	90	**0.9**

The polygraph/polygraph machine/polygram.

This question was very well answered.

Question 5b

Marks	0	1	2	Average
%	15	33	52	**1.4**

Limitations include:

- it does not detect lies, just physiological responses of arousal
- higher arousal may not be caused by a lie; it may represent some other emotion besides guilt, and innocent people may be found guilty
- some people can lie without showing physiological arousal
- the baseline level may be artificially elevated by self-inflicted pain when control questions are asked.

This question was generally well answered. It appears that the functions and limitations of the polygraph as a lie detector were well understood.

Question 6a

Marks	0	1	Average
%	47	53	**0.5**

Psychological factors, such as prolonged stress, may contribute to physical damage or changes in physiological functioning of the body. These changes can be detected and monitored (they have physiological symptoms), therefore they are not imagined.

Many students did not achieve a mark for this question because they discussed psychological disorders such as depression rather than physiological symptoms, as indicated by the 'soma' in psychosomatic.

Question 6b

Marks	0	1	2	Average
%	29	32	38	**1.1**

6bi.
Stage 3: exhaustion

Many students who failed to gain the mark here did not indicate **both** the name of the stage and the number, as was required by the question.

6bii.
Psychosomatic illnesses may occur because the body's mental, physical and emotional resources are depleted. This means the body can offer little resistance to disease and is vulnerable to physical illnesses and infections. A psychosomatic illness may be the result of prolonged stress.

It is emphasised that the three stages are:

- 1: alarm
- 2: resistance
- 3: exhaustion.

Shock and countershock are not stages of the general adaptation syndrome (GAS).

Area of Study 2 – Visual Perception

It seems that there are several areas of common misunderstanding in this Area of Study. A remarkably large number of students were not clear in their understanding of the binocular depth cue of retinal disparity. Poor scoring on questions that addressed fundamental concepts such as the Gestalt principle of similarity and perceptual set indicated the need for precise and comprehensive answers with well chosen examples.

Question 7

Marks	0	1	2	3	Average
%	20	9	23	48	**2.0**

- electromagnetic
- electrochemical
- photoreceptors (or rods and cones).

Students responded well to this question.

Question 8

Marks	0	1	2	Average
%	65	28	7	**0.4**

Any example that clearly demonstrated an understanding of the Gestalt principle of similarity was accepted.

This question was poorly answered, mainly because students did not appear to appreciate the essential feature of the Gestalt principles; the 'Good Form' aspect which dictates that stimuli are perceived not as separate items but as a **meaningful whole**. Too many students simply stated that 'When objects are alike in shape, size or colour, they are grouped together (or seen as a group) – such as children in school uniforms.' This statement did not **clearly explain** the principle, as required by the question.

The best answers included those that referred to Ishihara's colour-blindness tests or the pointillist technique of painting, and those that used a diagram of rows or columns to contrast items together with an explanation.

Question 9a

Marks	0	1	Average
%	65	35	**0.4**

The slight difference between retinal images is due to the eyes being approximately 6.5cm apart.

This question was extremely poorly answered, considering its simplicity.

Question 9b

Marks	0	1	Average
%	82	18	**0.2**

This slight difference between retinal images acts as a binocular cue for depth perception. The greater the difference between images, the closer the object.

This question was extremely poorly answered. Many students described the depth cue of **relative size**, while others discussed **convergence**. Both of these depth cues are clearly different from **retinal disparity**.

Question 10a

Marks	0	1	Average
%	61	39	**0.4**

Either of:

- the propensity to perceive a stimulus in a certain way, therefore focusing on aspects that support this expectation while ignoring others (interpretation)
- the propensity to select certain aspects of the visual field on which to focus attention (selection).

Although some textbooks refer only to perceptual set as it affects **interpretation**, both the effects on interpretation and selection are appropriate and either was accepted. If the question had been worth two marks, both would have been required.

Question 10b

Marks	0	1	2	Average
%	63	14	22	**0.6**

Any example that used a past experience to explain the perceptual set that exists because of this past experience was accepted. It may also have indicated that without this perceptual set, a different perception may have occurred. Examples would include the Rat-Man either following presentation of line drawings or as a result of past life experiences.

Bruner and Mintern's ambiguous 'B' or '13' stimulus was accepted as long as the students clearly distinguished **past experience** from **context** in their explanation.

This question was poorly answered, which suggests that students had difficulty in applying their knowledge.

Question 11a

Marks	0	1	2	Average
%	24	35	41	**1.2**

The Ames room is trapezoidal in shape, not a standard rectangular shape. One back corner is taller and further away than the other back corner. The floor must be sloped away from the near corner. The peephole is located so that the image of the room is the familiar image of a rectangular room. The peephole eliminates the use of the (strongest) binocular depth cues.

Most students were able to make a reasonable attempt at this question. It is recommended that students practise their expression in writing the description of this illusory room, as many answers lost marks because they were too vague.

Question 11b

Marks	0	1	2	Average
%	14	42	44	**1.3**

Both people would experience the illusion, despite Kane's understanding its working.

Since one mark was available to students who stated that either of the people would experience the person appearing to grow in size, it is surprising that 43% of students gained no marks. Many students made comments such as 'the two people will appear to be of different sizes' which was obviously **not** what was meant by the question.

Area of Study 3 – States of consciousness

It is apparent that students had a good understanding of this Area of Study, but there were some patches of weakness as indicated in the comments below. It is noted that the 'Research Methods' questions in this section were not well answered.

Question 12

Marks	0	1	2	Average
%	13	29	58	**1.5**

Selective attention is the act of focusing on one event (to the exclusion of others). Divided attention is where a person focuses on two or more events simultaneously.

Many students simply made statements about controlled and automatic processes, without distinguishing selective and divided attention as required by the question.

Question 13a

Marks	0	1	2	Average
%	22	14	64	**1.4**

- alpha (α)
- beta (β)

This question was generally well answered. Students who failed to achieve any marks generally displayed no knowledge of brainwave activity.

Question 13b

Marks	0	1	2	Average
%	59	22	20	**0.6**

Theta waves, which are of lower frequency and higher amplitude than alpha waves, appear and start to replace alpha waves.

Despite the fact that various wave types are shown in this stage, theta waves **define** Stage 1 NREM sleep therefore this was the required answer,

The typical 'stages of sleep throughout the cycle' diagram that appears in almost all textbooks needs explanation, because students commonly read 'REM' sleep as occurring **in** Stage 1. It must be emphasised that Stage 1 sleep, as indicated by the wording of the question, is an **NREM** stage. There are **five** stages in all.

Question 14a

Marks	0	1	2	3	Average
%	33	16	39	12	**1.3**

Problems could include:

- difficulty falling asleep (sleep onset insomnia)
- waking during the night and having difficulty falling back to sleep (sleep maintenance insomnia – 1)
- waking prematurely from sleep (sleep maintenance insomnia – 2).

As indicated above, the question demanded problems with the **sleep pattern**; therefore answers such as 'daytime fatigue' were not acceptable.

Question 14b

Marks	0	1	2	Average
%	33	46	22	**0.9**

14bi.

An **excessive** feeling of sleepiness during the day, despite having had a more than adequate amount of sleep the night before.

14bii.

Twelve hours or more.

Students should always state **units** when they are asked to indicate a quantity – especially if the units are not stated in the question (as in this case).

Question 15a

Marks	0	1	Average
%	68	32	**0.3**

Because Prof. Hoffman has a stated **expectation** as to the outcome of the experiment. He may (even inadvertently) treat the experimental group differently from the control group, therefore having an effect on the value of the dependent variable.

Many students did not follow the instructions in the question to answer in terms of **experimenter effect**.

Question 15b

Marks	0	1	2	Average
%	46	17	37	**0.9**

Either of:

- single blind design – get an assistant who has no knowledge of the expected outcome to run the experiment (or some other form of blinding)
- double blind design – neither experimenter nor subjects are aware of which subjects are assigned to which condition.

Many students suggested **repeated measures** or **matched participant** designs. This would have been useful for eliminating other possible problems, but not the experimenter effect as was required by the question.