

GENERAL COMMENTS

Students generally performed well on the June paper with results, on average, being very comparable with Examination 1 in 2003.

In the multiple-choice section all three areas were well answered with mean performance for Visual Perception only slightly lower than for States of Consciousness and Biological Bases of Behaviour. As in previous years, students performed less well on the short-answer questions, 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 the requirement for this was explicitly stated in the question.

Teacher(s) had clearly instructed and directed students' attention to key knowledge and skill in the Study Design. In general, students demonstrated good knowledge and understanding of the study though, as in previous years, many performed below their capabilities by not addressing all aspects of the questions in their answers. For example, when required, in Question 4i. to name 'What **side** and **lobe** of Justin's brain is most likely to have been affected?' many students gave only the hemisphere **or** the lobe. In a question worth one mark only, such an answer could not be awarded any credit. Students need to read the short-answer questions very carefully and then check their answers against the question requirements – in some questions the need for a two-part response is implicit but not specified, for example a response to Question 11 required both an explanation of what is meant by **convergence** in this context and an explanation of how that helped a person judge distance.

Marking policies

Short-answer questions worth two marks require two key terms and/or pieces of information. Three-mark questions require three terms and/or pieces of information e.g. Question 3, Question 13.

In some cases, two distinct terms and/or statements were required for each mark (e.g. Question 4 i. and Question 5 i.) and this was made clear in the question stem. Within these limits, assessors judge students' knowledge and understanding on the answers provided.

SPECIFIC INFORMATION

Section A - Multiple-choice questions

The table below indicates the approximate percentage of students choosing each distractor in response to the 45 multiple-choice questions. The correct answer is indicated by shading.

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

Biological Bases of Behaviour

	A	B	C	D
Question	%			
1	14	7	68	11
2	76	15	6	3
3	1	0	96	3
4	1	2	94	3
5	4	4	1	90
6	9	2	85	4
7	14	58	12	16
8	16	32	30	21
This question required the knowledge that stimuli from the left visual field are processed in the occipital lobe of the right hemisphere and that the left hand is controlled by the (primary motor cortex of the) right hemisphere. Since there is no communication via the corpus callosum, signals cannot be sent to the area of the brain that controls the right hand as was suggested in the most popularly chosen alternative (B).				
9	0	3	96	1
10	20	35	18	28
Although there can be considerable argument that the frontal and indeed occipital lobes are highly activated in such a problem, of the alternatives offered, right parietal lobe is the most correct answer.				
11	71	7	21	1

12	61	5	29	5
The presence of the phrase <i>internal muscles and glands</i> disqualifies the relatively popular alternative 'C' as a correct response.				
13	86	4	6	4
14	5	92	2	1
15	45	33	2	19
This question refers to the effects of <i>prolonged or intense arousal</i> . This demonstrates the importance of students being familiar with the content and wording of the Study Design.				

Visual Perception

	A	B	C	D
Question	%			
16	17	2	9	71
17	4	86	10	1
18	5	6	87	2
19	20	12	59	8
20	69	18	0	12
21	3	11	33	53
22	67	13	6	14
23	1	32	9	58

It appears that the juxtaposition of the words 'focus' and 'lens' caused many students to leap to the wrong conclusion and choose alternative 'B' – careful reading of the question is required.

24	17	21	47	14
This question again demonstrates the need for careful reading of the question. The relatively popular alternatives 'A' and 'B' are clearly impossible. A - the <i>visual angles</i> must be identical if the objects cast the same retinal image. B – if the objects are the same size but at different distances, they could not cast the same retinal image.				
25	60	2	37	1

Clearly the concepts of 'Top-down' and 'Bottom-up' processing are not clearly distinguished in the minds of many students.

26	87	6	6	0
27	3	3	92	2
28	55	13	23	8
The relatively popular alternative 'C' is in fact the opposite of the true explanation.				
29	52	40	6	3

Since the Muller-Lyer illusion is included in the newly accredited Study Design, it is emphasised that the apparent distance hypothesis should be clearly understood.

30	5	53	39	3
As in the comment to Question 28, the popular alternative 'B' is exactly the opposite of the explanation according to the apparent distance hypothesis.				

States of Consciousness

	A	B	C	D
Question	%			
31	12	86	1	0
32	2	4	0	93
33	5	33	3	59

Alternative 'D' is clearly the most correct alternative.

34	83	2	9	6
35	38	29	20	14

As in several other questions, careful reading of the question would have eliminated the popular but incorrect alternative 'A', which does not relate to reduction in *pain threshold*.

36	3	62	27	8
The <i>most correct</i> response is clearly 'B' since this incorporates the various ways in which pain may be controlled by psychological factors, the relatively popular alternative 'C' is one way in which pain may be reduced.				
37	4	3	92	1
38	15	13	69	2

Knowledge of the Study Design would clearly flag 'C' as the correct response.

39	5	72	6	17
40	65	13	4	18
41	0	95	3	1
42	83	6	0	11

43	76	16	4	5
44	3	12	74	12
45	11	68	4	17

Section B - Short-answer questions

Biological Bases of Behaviour

The organization of the primary motor cortex and primary somatosensory cortex were not well explained. Hemispheric specialization is an area that requires special attention, as in 2002, most students could not adequately explain the implications of severance of the corpus callosum. There was also widespread misunderstanding of the fact that the corpus callosum is not the *only* connection between the two hemispheres, a person with a 'split brain' would indeed still have images from the left visual field sent to the right occipital lobe and vice-versa. Apart from these two areas of weakness, this section was generally well-answered.

Question 1

Marks	0	1	2	Average
%	45	24	32	0.86

This question was moderately well answered. One mark each was awarded for any two of the following points:

- To transfer sensory information from receptors in the body (or the PNS) to the brain.
- To transfer motor information from the brain to the skeletal muscles and glands (or the PNS).
- to control and enable the spinal reflex.

N.B Many students indicated that the spinal cord carried signals between the 'CNS and PNS' clearly this could gain no marks as the spinal cord is an integral part of the CNS.

Question 2

Marks	0	1	2	Average
%	11	8	81	1.7

This question was well answered. Students were awarded one mark for indicating that the somatosensory cortex is located in the **parietal** lobe and one mark for indicating that the motor cortex is located in the **frontal** lobe. No other alternatives were acceptable.

Question 3

Marks	0	1	2	3	Average
%	8	13	23	55	2.25

This question was reasonably well answered. The question was assessing knowledge of hemispheric specialization and one mark each was awarded for information such as the following (the list is not exhaustive):

Uncle Toby might experience problems with

- disruptions in movement in LHS of body
- disruptions in sensations in LHS of body
- difficulty in the area of creativity
- difficulty in the area of visual processing e.g. recognizing shapes and colours
- difficulty in the area of spatial ability
- difficulty in the area of music and/or art appreciation
- difficulty in the area of non verbal tasks
- left neglect syndrome

Question 4

i.

Marks	0	1	Average
%	21	79	0.79

Both **left** (hemisphere) and **temporal** (lobe) were required for one mark to be awarded. No other answers were acceptable.

ii.

Marks	0	1	2	Average
%	10	38	53	1.42

Any two of the following difficulties achieved full marks:

Justin's speech would be articulate but meaningless

Justin would have difficulty interpreting what was said to him

Justin would have difficulty selecting the correct words to express his ideas

Question 5

i.

Marks	0	1	Average
%	51	49	0.48

One mark was awarded for the terms **shock** and **countershock**. The order in which the terms appeared was not important.

ii.

Marks	0	1	Average
%	78	22	0.22

A liberal approach was taken to the assessment of this question. Any graph that showed the level of resistance commencing on the 'normal' line in the *alarm* stage, dropping below that line and rising above it before entering the *resistance* stage then dropping below the 'normal' line at or within the *exhaustion* stage achieved one mark.

iii.

Marks	0	1	Average
%	33	67	0.66

Students were awarded one mark if they indicated that the immune system would be weakened and/or less able to combat infections (bacterial or viral). References to heart disease or hypertension did not achieve a mark, since the questions specifically referred to the *effect on the immune system*.

Question 6

i.

Marks	0	1	Average
%	43	57	0.56

Students were required to indicate that this is a response to a threat triggered by the autonomic nervous system, preparing an animal to confront a threat or to escape it by running away.

A variety of responses was accepted but it is emphasized that students who simply indicated that it is a '...response enabling an organism to fight or flee' did not receive credit.

ii.

Marks	0	1	Average
%	63	37	0.36

To gain credit for this question, students were required to indicate that this is an **adaptive** response the purpose of which is **survival**.

Visual Perception

This was the weakest of the three areas of study in the short answer section. The poor showing on Question 10i emphasises the importance of students applying their answers to the specific question as set and not making generic statements where an application of a concept is required. In previous examinations, students have been asked to explain visual illusions that occur as a result of misperceptions of depth or distance. In 2004 Question 13 asked exactly this, with relatively poor results; students need to understand not only what a visual illusion *is*, but also why and how our perception is deceived. Many students described the Ames Room where an explanation of the Ponzo Illusion was required!

Question 7

Marks	0	1	2	Average
%	39	23	39	0.99

This question was answered reasonably well. Students were generally able to describe at least one type of threshold adequately; since the multiple-choice section of this paper contained a question (Question 18) that referred to the JND without requiring that it should be the smallest change in stimulus intensity that can be detected *50% of the time* this detail was not required of students in response to Question 7.

Question 8

Marks	0	1	2	3	Average
%	4	10	27	59	2.42

This question, testing knowledge and recall, was well answered. Marks were awarded to students who indicated that cones are located at the fovea, or at the periphery as well as the fovea.

Rods also respond best to targets in dim light (they do not respond well at all in bright light) and to blue-green wavelengths (about 500nm) of electromagnetic energy.

Cones respond well to bright light and to red-yellow wavelengths, though blue-green was accepted as long as red-yellow was also checked.

Question 9

Marks	0	1	Average
%	40	60	0.59

Orientation Constancy earned one mark. Many students carelessly wrote ‘Orientation Consistency’ and ‘Shape Constancy’ was a common error.

Question 10

i.

Marks	0	1	Average
%	86	14	0.14

This question was extremely poorly answered. Many students accurately defined Relative Size as a depth cue, but failed to indicate how it could be used to convey depth or distance in a painting, they could therefore not gain a mark.

ii.

Marks	0	1	Average
%	27	73	0.72

It was surprising that over 25% of students could not **name** a pictorial depth cue. A common error was ‘Shape Constancy’.

Question 11

Marks	0	1	2	Average
%	65	25	10	0.45

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

For full marks, students needed to indicate that *convergence* is the depth cue that applies within about seven metres of the observer as the eyes turn inwards to keep an object central in the visual field (located as close to the fovea as possible). They **also** needed to show how this assists in judging distance – the greater the turning (tension on the orbital muscles) the closer the object to the observer.

Many students wrongly identified the ciliary muscles as being responsible for turning the eyes.

Question 12

Marks	0	1	2	Average
%	38	34	29	0.9

Marks were awarded for identification of difficulties with central vision, visual acuity and colour vision.

Question 13

Marks	0	1	2	3	Average
%	43	25	18	14	1.01

Students had difficulty with the complexity of an explanation for this question and it is emphasized that although the Ponzo Illusion is not present in the newly accredited Study Design, the Muller-Lyer Illusion, with the same apparent distance hypothesis is still required.

The important points are made in this answer was that:

- i. both horizontal lines cast identical size retinal images (or that both lines are identical in size)
- ii. the upper line is misperceived to be more distant (or the lower line is misperceived to be closer) due to either or both of *linear perspective* (caused by the converging lines) and *height in visual field* and the 'more distant' object, casting the same sized image, is misperceived to be longer (or the 'closer' image is misperceived to be shorter).

States of Consciousness

Students appeared to have good knowledge of this area of study although problems arose in terms of the way in which students answered some questions – for example, question 18 required the *description* of the way in which meditation can be used to relieve pain, and many students failed to provide a description. The understanding of the concept of *psychological evidence* was also not well understood by many students.

Question 14

i.

Marks	0	1	Average
%	45	55	0.54

GSR is a measure of the electrical conductivity of the skin's surface, or, resistance of the skin's surface to the passage of electricity. – A student may also indicate that GSR is inversely proportional to the resistivity of the skin's surface. A response of 'sweat' was not given credit.

ii.

Marks	0	1	Average
%	74	26	0.25

Students were required to indicate that conditions **other than** altered states of consciousness can cause variation in GSR. Examples such as ambient temperature, exercise, emotion etc. were acceptable.

Question 15

Marks	0	1	2	Average
%	45	18	37	0.92

It is emphasized that *psychological evidence* does not include pulse-rate, blood pressure, GSR etc.

Marks were given for answers that were able to *describe* such conditions as altered perceptions of time, unusual emotionality, altered suggestibility etc.

Question 16

Marks	0	1	2	Average
%	19	36	45	1.25

Generally this question was well answered. Any accurate description of differences, such as awake/asleep; beta-like waves/alpha waves present. Students should be aware that Daydreaming is an **altered state of consciousness** that occurs regularly throughout our waking periods. The altered brainwaves, altered perceptions of time, altered emotionality etc. are all evidence of this.

Question 17

Marks	0	1	2	3	Average
%	3	18	56	23	1.99

The most common error was failure to identify that *nightmares* are more common in females (about 50%) and that night terrors occur in stage 3-4 sleep.

Question 18

Marks	0	1	2	Average
%	21	62	17	0.95

Students needed to describe the process by which meditation can redirect attention onto stimuli other than the pain, thus reducing perception of the pain.

Production of endorphins and reduced pain through muscle relaxation were also acceptable points.

Question 19

i.

Marks	0	1	Average
%	34	66	0.66

Most students correctly identified *sleep apnea (apnoea)* as involving the involuntary cessation of breathing, for between 30 seconds and two minutes.

ii.

Marks	0	1	Average
%	79	21	0.2

Students were required to indicate that the EOG measures *electrical activity* of the *muscles that control eye-movement*. Statements such as '*electrical activity in the eyes*' or '*the activity of the eye muscles*' did not receive credit.

Question 20

Marks	0	1	2	Average
%	21	27	52	1.3

This question was generally well-answered. Any appropriate characteristic earned one mark, to the maximum of two marks for the question. Characteristics such as the following were accepted (the list is not exhaustive):

- Constant daytime sleepiness
- Requiring excessive amounts of sleep each night
- Excessive feeling of fatigue even after a good night's sleep
- Difficulty performing simple tasks
- Drooping eyelids