

GENERAL COMMENTS

Students performed very well on the June paper and the results were slightly higher compared to Examination 1 in 2001. Teachers had clearly instructed and directed students' attention to key concepts and phenomena in the study design. In general, students demonstrated good knowledge and understanding of the curriculum but many performed below their capabilities by not addressing all aspects of the questions in their answers. For example, when required to name *and* describe three features (e.g. Question 12, 14, and 18) many students only named *or* described the features thereby failing to gain any marks for their answers. Students need to read the short-answer questions very carefully and then check their answers against the question requirements.

In the multiple-choice section all three areas were well answered with mean performance for Biological Bases of Behaviour and Visual Perception only slightly lower than for States of Consciousness. Performance overall on the multiple-choice questions was slightly better than for the 2001 June paper reflecting high content accessibility. Predictably, students performed less well on the short-answer questions, often because of a lack of precision and completeness in descriptions and definitions, or failure to refer to appropriate psychological information in their answers.

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. However, in some cases, two distinct terms and/or statements were required for each mark (e.g. name *and* describe or explain, Question 12, 14, and 18), and this was made clear in the question stem. Within these limits assessors judge students' knowledge and understanding on the answers provided.

SPECIFIC INFORMATION

Multiple-choice questions

The correct alternatives for the 45 multiple-choice questions together with the percentage correct answers are shown below. This table indicates the approximate percentage of students choosing each distractor. The correct answer is the shaded alternative.

This section of the paper was very well answered with only two 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

Question	A	B	C	D	
1	21	7	69	2	Many students incorrectly selected alternative A (<i>aggression; fatigue</i>) rather than the correct alternative C (<i>stomach ulcers; anxiety</i>). This may reflect misunderstanding of the two effects or confusion between physiological and psychological bases of behaviours.
2	3	95	1	1	
3	9	5	73	13	
4	13	2	84	0	
5	78	8	8	6	
6	2	2	95	2	
7	78	2	14	5	
8	96	1	0	3	
9	5	83	10	1	
10	4	86	2	8	
11	12	23	4	60	
12	22	3	1	74	
13	16	*65	18	*65	*Both B and D were accepted as correct responses.
14	2	6	74	18	
15	51	24	19	6	A number of students incorrectly selected alternative B (<i>Angie will respond more slowly to words shown on the right side of the screen</i>) indicating a lack of knowledge of

left and right hemisphere functions and/or a misunderstanding of the crossover of left and right visual information. Words presented to the right side of the screen (i.e. right visual field) will be responded to faster as they will be sent or registered directly in the left or verbal hemisphere of the brain. Words will be responded to more slowly when presented on the left side of the screen (correct alternative A) as they will be sent first to the right or non-verbal hemisphere and then have to be transferred to the left hemisphere for processing.

Visual Perception

Question	A	B	C	D	
16	3	0	1	96	
17	8	4	75	13	
18	2	3	5	90	
19	81	3	10	5	
20	3	86	0	10	
21	2	79	17	2	
22	69	13	2	16	
23	5	9	66	20	
24	3	3	94	0	
25	12	1	6	80	
26	1	8	91	1	
27	9	30	11	50	Many students incorrectly believed alcohol affects visual perception by contracting the pupils (alternative D). Alcohol has the reverse effect dilating the pupils resulting in too much light entering the eye. Alcohol also restricts peripheral vision (field of vision) and affects size constancy causing objects to appear smaller than normal. Colour perception is affected by alcohol; therefore alternative B (<i>making it difficult to distinguish colours</i>) is correct.
28	1	72	16	11	
29	62	4	7	28	Although quite well answered, many students incorrectly selected alternative D (<i>ciliary muscle</i>) as the structure controlling the pupil confusing the pupil and lens. The <i>iris</i> (alternative A) controls pupil size.
30	44	30	10	16	This question baffled many students who incorrectly selected alternative B (<i>retinal disparity</i>) as the depth cue not available when viewing objects at a distance of 8 metres. The correct answer is <i>convergence</i> (alternative A) as this cue is useful only when viewing objects up to 1–2 metres away.

States of Consciousness

Question	A	B	C	D	
31	6	2	91	1	
32	1	1	98	1	
33	1	81	17	2	
34	98	1	0	1	
35	3	8	86	3	
36	1	97	1	1	
37	6	2	4	88	
38	13	7	12	68	
39	3	8	72	16	

40	67	15	2	15	
41	3	7	21	70	
42	5	57	36	3	Many students incorrectly selected alternative C (<i>beta and alpha waves</i>) as the characteristic brainwaves associated with Stage 1 sleep. The correct answer is (B) (<i>alpha and theta</i>) because beta waves occur in normal waking consciousness and REM sleep and not in Stage 1.
43	21	7	68	4	Those students who incorrectly selected alternative A (<i>high; low</i>) transposed the amplitude and frequency dimensions of beta waves. Alternative C (<i>low; high</i>) correctly describes the amplitude and frequency characteristics of beta waves.
44	7	2	10	81	
45	9	88	2	1	

Short-answer questions

Biological Bases of Behaviour

Most students knew that sound stimuli are processed in the auditory cortex of the temporal lobe (Question 1) and could name the corpus callosum as the structure that connects the right and left cerebral hemisphere (Question 2i). More than half of students, however, could not explain how severing the corpus callosum affects a person's ability to name an object projected to the right hemisphere (Question 2iii). In Question 4i most students knew that a sensory neuron provides information about touch but only about a third could correctly identify the main sensory and motor functions involved in the bead classification task (Question 4ii). Most students named fight or flight (Question 5i) as the body's response to an emergency situation and knew that it was controlled by the sympathetic nervous system (Question 5ii). Only a little over half of students, however, named somatosensory cortex as the area where touch is registered (Question 6i), but most knew that the hands would cause the largest area of the brain to respond to a pressure stimulus (Question 6ii). Only some students could explain why such a large response to the stimulus would occur (Question 6iii).

Question	Marks	%	Comments
Question 1	0/2	9	Sound stimuli are processed in the <i>auditory cortex</i> located in the <i>temporal</i> lobe. This question was well answered although many students incorrectly answered parietal or frontal lobe.
	1/2	26	
	2/2	65	
Question 2	Q2i		The connection that allows communication between the two cerebral hemispheres, the <i>corpus callosum</i> , was correctly answered by most students.
	0/1	12	
	1/1	88	
	Q2ii		Most students correctly stated that Phillip would be <i>unable to name</i> what he saw on the left side of the screen. Answers that claimed Phillip would not respond to, or recognise, the stimulus lacked sufficient precision and gained no marks. Such answers could incorrectly imply Phillip did not see the stimulus, or that he could not identify or recognise the stimulus even using other senses, such as touch. Some students correctly indicated Phillip would be unable to name the stimulus but were then penalised for incorrectly stating the stimulus had not been registered by the right hemisphere. Students should be advised that providing more information than is necessary may result in a penalty if the additional information is incorrect.
	0/1	27	
	1/1	73	
Question 3	2iii		Phillip was unable to name the object because <i>the picture on the left side of the screen is sent directly to, and processed by, the non-verbal right hemisphere and could not be transferred to the speech areas in the verbal left hemisphere</i> (as the corpus callosum had been severed).
	0/1	55	
	1/1	45	
Question 3	0/2	34	This question was not well answered. Students had to state that a) sensory neuron activity involves <i>sending messages from receptors or sense organs to the central nervous system</i> , and b) motor neuron activity <i>involves messages being sent from the central nervous system to muscles, organs or glands (or the body)</i> . The most common error was a lack of precision with many students failing to indicate the origin and destination of sensory and motor neuron activity.
	1/2	19	
	2/2	47	
Question 4	4i		The type of neuron (<i>sensory, afferent or touch receptor neuron</i>) was correctly answered by nearly all students.
	0/1	8	

	1/1	92	
	4ii		
	0/2	38	
	1/2	26	
	2/2	36	Correctly describing the main functions of the central nervous system in carrying out the two tasks was not well answered. Students had to state for Task 1 that the <i>CNS processes the sensory (touch) information about bead texture to assess whether it is rough or smooth</i> , and for Task 2 the <i>CNS initiates a voluntary motor response to enable Pam to place the bead in the appropriate group</i> . Common errors were either misinterpreting the tasks or failing to identify the role played by the CNS in the classification and placing of the beads.
Question 5	5i		
	0/1	22	
	1/1	78	Most students knew <i>fight or flight</i> as the body's response to an emergency situation.
	5ii		
	0/1	22	
	1/1	78	Most students correctly named <i>sympathetic</i> as the branch of the autonomic nervous system as responsible for the emergency response.
Question 6	6i		
	0/1	22	
	1/1	78	Many students could not name <i>somatosensory</i> as the body sense area in the brain.
	6ii		
	0/1	22	
	1/1	78	Most students knew that a pressure stimulus applied to the <i>hands</i> would cause a larger area of the brain to respond than the arms, legs and feet.
	6iii		
	0/1	22	
	1/1	78	Many students could not explain why such a large response would be triggered by a pressure stimulus to the hands. The correct answer is that <i>more (area) of the somatosensory cortex is devoted to sensory inputs from the hands than legs, arms or feet resulting in the large response</i> . Answers referring to the hands being more sensitive to touch were insufficient to gain a mark.

Visual Perception

More than half of students could not name a function of the retina (Question 7), and only a little under half could both name and explain a Gestalt principle involved in camouflage (Question 8i). Even fewer students could give an example of the operation of a principle that works to increase the identifiability of an object from the background. Most students identified the *cornea* and *iris* as the two structures of the eye (Question 9) and correctly named *lens* as the structure affecting focus with ageing (Question 10i). Many students could not explain the nature of deterioration of the lens with age (Question 10ii), or correctly define *just noticeable difference* (Question 11) or correctly name and describe three pictorial depth cues (Question 12). The relatively poor performance on Question 12 is surprising as exactly the same information was requested in a different context in the 2001 paper.

Question	Marks	%	Comments
Question 7	0/2	53	This question was quite poorly answered. Students had to list two of the following functions of the retina: a) <i>registers, converts or transduces light energy</i> (or <i>electromagnetic energy</i>); b) <i>processes the image projected on to it</i> ; and c) <i>transmits neural messages to the (visual cortex of the) brain for further processing</i> . Many students confused the retina with other structures such as the lens, pupil and cornea suggesting a lack of knowledge of the main parts of the eye and their specific functions.
	1/2	36	
	2/2	12	
Question 8	8i		
	0/2	23	Most students correctly named one Gestalt principle operating in camouflage. However, less than half of students could provide an adequate explanation of the operation of the principle. For full marks any of the following Gestalt principles and explanations were acceptable: a) <i>similarity – camouflage uniform looks similar to the background, or blends in with the ground</i> ; b) <i>continuity or good continuation – the contours of the camouflage uniform perceptually merge with or continue with the background features</i> ; or, c) <i>figure-ground – the camouflage uniform (figure) cannot be separated from the background</i> . One mark was awarded to a correct name or explanation of an appropriate Gestalt principle.
	1/2	32	
	2/2	45	
	8ii		
	0/1	69	Most students struggled to describe an example where the Gestalt principle helps make the figure (i.e. defence force members) <i>more</i> obvious or distinguishable from the background. Acceptable answers had to refer to a quality of the figure or uniform that made it clearly <i>different</i> from the ground:
	1/1	31	

			a) <i>dissimilar in texture, contrast, colour, i.e. fluorescent colours of first aid workers etc.</i> ; b) <i>discontinuity of contours – different pattern or colour setting the uniform apart from the background</i> ; or c) <i>clear figure-ground separation due to different colours, texture or pattern than the background</i> . Any example of bright-fluorescent or high contrast clothing or emblems, or clothing that is distinctly different in texture, patterning or contours to the ground was acceptable.
Question 9	0/2 1/2 2/2	22 27 51	Students had to correctly name the two structures of the eye as <i>cornea</i> (Q9i) and <i>iris</i> (Q9ii). Many incorrectly labelled the cornea as the retina or lens while others labelled the iris as the ciliary muscle.
Question 10	10i 0/1 1/1	 43 57	This question was well answered with most students naming <i>lens</i> as the structure causing difficulties focusing in the elderly.
	10ii 0/2 1/2 2/2	 62 19 20	Many students could not explain why deterioration of the lens affects vision. Students had to state that: a) <i>with age the lens loses its elasticity</i> ; and, b) <i>it becomes harder to change its shape, i.e. harder to bulge to focus nearby objects</i> . Answers that referred simply to loss of accommodation with age were deemed insufficiently precise and gained no marks. No marks were awarded in Question 10ii if the structure named in Question 10i was incorrect.
Question 11	0/2 1/2 2/2	41 22 37	Students had to state that the just noticeable difference is: a) <i>the smallest (or minimum) perceptible (or detectable) change</i> ; and b) <i>in a stimulus, or difference between two stimuli</i> . The most common errors were to define the absolute threshold rather than the difference threshold or lack of precision by merely restating the terms ‘just noticeable’ as part of the answer. For example, the definition ‘when you just notice a difference in a stimulus’ was not acceptable.
Question 12	0/3 1/3 2/3 3/3	33 16 19 32	Students had to correctly name <i>and</i> describe three pictorial depth cues. Acceptable cues and descriptions were: a) <i>linear perspective – parallel lines drawn to converge to depict distance</i> b) <i>interposition or overlay – more distant objects (in background) are obscured or overlaid by nearer objects (in foreground)</i> c) <i>texture gradient – appearance of coarser textures of near objects and finer textures of distant objects</i> d) <i>relative size – distant objects are smaller in size (smaller retinal image size); nearer objects are drawn larger in the picture (cast larger retinal image sizes)</i> e) <i>height in visual field, height on the plane – objects drawn higher on the ground (or lower in the sky) or nearer to the horizon are more distant</i> . f) <i>aerial perspective – distant objects have less contrast, are duller, fuzzier, less colourful than nearer ones</i> g) <i>highlights and shadows – highlights depict convex surfaces, shadows depict concave surfaces</i> . The most common flaw was the failure to both name <i>and</i> describe the pictorial depth cue for each mark.

States of Consciousness

These questions were answered well with most students correctly naming the stage of sleep during which sleeptalking occurs (Question 17i) and accurately defining lucid dreaming (Question 17ii). Students did less well when defining automatic processing (Question 13) and had difficulty naming the type of brainwave pattern and heart rate changes that occur in REM sleep. Nearly all students knew *narcolepsy* as the disorder characterised by sudden and uncontrolled sleep but less than a quarter of students could describe two physiological symptoms of the disorder. Many students could not name and describe any psychological characteristics of an altered state of consciousness (Question 14), or accurately name a device and explain how it can be used to indicate REM sleep (Question 18). Similar questions have appeared in previous Unit 3 examination papers. The most common flaw in students’ answers was failing to both name *and* explain the type of physiological change monitored by each device. No marks were awarded for giving only the name *or* an explanation.

Question	Marks	%	Comments
Question 13	0/2	44	This question was not well answered. Students had to list any two of the

	1/2 2/2	33 23	following features of automatic processing: a) tasks performed with little or no conscious awareness; b) tasks requiring little mental effort (or concentration, or attention); or, c) tasks that do not interfere with the performance of other activities (i.e. attention can be divided between tasks).
Question 14	0/3 1/3 2/3 3/3	41 21 20 18	This question was not well answered. Students had to name and describe three psychological characteristics of an altered state of consciousness. A name or description alone was not sufficient to gain a mark. Any three of the following names and descriptions were acceptable: a) self-control (controlling movements) – difficulty controlling or coordinating movements b) cognitive distortions/memory – disorganised thought; difficulty maintaining attention; illogical thinking; poor problem solving; recall fragmented and less accurate; content of consciousness less constrained. c) changed sensory thresholds/perceptual distortions/loss of identity – heightened or dulled senses, threshold changes; increased pain threshold; loss of self identity. d) disturbed time sense – time may speed up or slow down compared to normal waking consciousness. e) changes in emotions/feelings – may feel more emotional or more subdued than normal.
Question 15	0/2 1/2 2/2	36 39 26	Most students did not answer that REM sleep is characterised by <i>beta</i> (or <i>irregular beta</i>) brainwave patterns and a <i>faster</i> (or <i>raised</i>) heart rate.
Question 16	16i 0/1 1/1	 11 89	This question was very well answered with most students correctly naming <i>narcolepsy</i> as the sleep disorder.
	16ii 0/2 1/2 2/2	 46 30 23	Many students were unable to describe either of the two physiological symptoms of the disorder: a) <i>cataplexy</i> or <i>loss of muscle tone</i> , and, b) <i>immediate REM sleep</i> . No marks were awarded in Q16ii if the disorder named in Q16i was incorrect.
Question 17	17i 0/1 1/1	 23 77	Most students correctly indicated that sleepwalking occurs mainly in <i>Stage 4</i> sleep. <i>Stage 3</i> and <i>NREM sleep</i> were also accepted.
	17ii 0/1 1/1	 19 81	This question was very well answered. Acceptable definitions of a lucid dream were: a) <i>a dream in which the person feels aware they are dreaming</i> ; or, b) <i>a dream where the dreamer can exert some control over the course of the dream</i> .
Question 18	0/3 1/3 2/3 3/3	67 19 7 7	This question was not well answered. The most common flaw was lack of precision in explaining the nature and direction of the physiological changes monitored by each device to determine REM sleep. Students had to name three of the following devices <i>and</i> explain how each device will indicate that the person is in REM sleep. a) <i>EEG/electroencephalograph</i> - <i>electrical activity of the brain (brainwaves) change to beta (or irregular low amplitude, high frequency waves)</i> b) <i>ECG/electrocardiograph</i> – <i>increased electrical activity in the heart muscle (i.e. heart rate increases)</i> c) <i>EMG/electromyograph</i> – <i>little or no electrical activity in body muscles (i.e. muscles relaxed, paralysed, atonia)</i> d) <i>EOG/electrooculargraph</i> – <i>increased electrical activity in eye muscles (i.e. rapid eye movements)</i> e) <i>Video monitoring of eyes</i> – <i>increase in the rate of eye movements under eyelids (i.e. rapid eye movements).</i>