OXFORD

INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL A-LEVEL

PSYCHOLOGY

PS03

Unit 3 Advanced Topics and Research Methods 2

Mark scheme

January 2023

Version: 1.0 Final

231XPS03/MS

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from oxfordaqaexams.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Section A: Psychology of Sleep **Total for this section: 30 marks**

Question	Marking guidance	Total marks
01	**One type of biological rhythm is a circadian rhythm. An example of a circadian rhythm is the sleep/wake cycle.** **Identify two other types of biological rhythms and give an example of each type.** Award marks as follows: **1 mark** for each correctly identified type (up to a maximum of 2 marks). **Possible Content:** • Ultradian • Infradian Credit other relevant rhythms eg circannual. Plus **1 mark** for each accurate example (up to a maximum of 2 marks). **Possible Content:** • Ultradian – phases of sleep, alertness, rest-activity. • Infradian – menstrual cycle, hibernation, seasonal affective disorder. Credit other relevant examples.	**4** **AO1 = 4**

Question	Marking guidance	Total marks
02.1	**Identify the type of sleep Ying enters 80 minutes after he falls asleep. With reference to the experiment above, explain how you know Ying has entered this type of sleep.** Award marks as follows: **1 mark** for correctly identifying the type of sleep – Rapid eye movement (REM) sleep. Plus **1 mark** for a clear explanation. **Possible Content:** • Ying's brain activity has become desynchronised or has increased which is a characteristic of REM sleep. • Ying entered the stage after 80 minutes and typically people enter REM sleep around 75 minutes after falling asleep.	**2** **AO2 = 2**

Question	Marking guidance	Total marks
02.2	**Identify three other characteristics of the type of sleep you identified in your answer to Question 02.1.** Award **1 mark** for each correctly identified characteristic. **Possible content:** • Loss of (body) muscle tone/muscle paralysis. • Rapid eye movement. • Increased heart rate. • Increased blood pressure. • Increased energy consumption. • Association with dreaming. • Difficult to wake up. Credit possible content for question 02.1 as a correct characteristic for question 02.2 providing they have not been used to answer question 02.1 Credit answer to 02.2 (if correct) in respect of answer to 02.1 even if answer to 02.1 is incorrect. Credit other relevant characteristics.	**3** **AO1 = 3**

Question	Marking guidance	Total marks
03	**Describe and evaluate research into memory consolidation as a function of sleep.** **Possible Description:** • Knowledge of memory consolidation theory. • Karni et al. (1994) selectively disrupted REM and NREM sleep. Found that visual discrimination depended on REM sleep but not NREM sleep. • Walker et al. (2002) found that motor learning improved if followed immediately by sleep and a significant positive correlation between the amount of improvement and the amount of stage 2 NREM sleep. • Diekelmann and Born (2010) concluded that REM sleep plays a role in the consolidation of procedural memory whereas NREM sleep helps the consolidation of declarative memory. During slow wave sleep in NREM declarative memories reactivate and are redistributed from the hippocampus to the frontal cortex. **Possible Evaluation:** • Reliable – there is substantial evidence supporting the role of sleep in memory consolidation. • Advances in techniques used to measure brain activity have helped to advance our understanding of the role of sleep in memory consolidation. • Methods used to measure brain activity still lack precision and thus do not give us a full/detailed understanding of the role of sleep in memory consolidation.	**9** **AO1 = 4** **AO3 = 5**

- Highly complex – the role of sleep in memory consolidation is very complex and we do not fully understand the processes involved.
- Extraneous variables – in early studies it was difficult to distinguish between the role of sleep and the role of simply being quiet and undisturbed.

Credit other relevant material.

Level	Description	Marks
3	Knowledge of research into memory consolidation is mostly accurate and generally well detailed. Evaluation is mostly effective. The answer is clear and organised. Specialist terminology is mostly used effectively.	**7–9**
2	Knowledge of research into memory consolidation is evident but with some inaccuracies/omissions. Evaluation is evident but lacks effectiveness in places. The answer lacks clarity and organisation in places. Specialist terminology is mostly used appropriately.	**4–6**
1	Knowledge of research into memory consolidation is limited. Evaluation is limited, poorly focused or absent. The answer lacks clarity and is poorly organised. Specialist terminology is either absent or inappropriately used.	**1–3**
0	No creditable content.	**0**

<table>
<tr><th>Question</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>04</td><td>
Discuss the effects of shift work on biological rhythms.

Possible Description:
• Working patterns dictate that some people are working when they should be sleeping.
• Leads to desynchronisation of endogenous pacemakers/internal body clocks with exogenous zeitgebers/environmental cues.
• Effects include: poor performance/attention/judgement during night shifts; increased risk of cancer and heart disease; increased risk of depression; sleep deprivation and fatigue due to interruptions to sleep during the day.

Possible Discussion:
• Use of supporting evidence for the effects of shift work, eg Davis et al. (2001), Coren (1996)
• Discussion of techniques devised to help people cope with the effects of shift work such as forward shift rotation, non-rotating shift work and rapid rotation.
• Use of evidence for techniques devised to help people cope with the effects of shift work, eg Czeisler, Moore-ede and Coleman (1982), Gordon et al. (1986), Phillips et al. (1991).
• Individual differences – some people suffer more severe effects of shift work than others which can lead to problems with generalisability of findings.

Credit other relevant material.

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>4</td><td>Knowledge of the effects of shift work is mostly accurate and generally well detailed. Discussion is mostly effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear and focused. Specialist terminology is mostly used effectively.</td><td>10–12</td></tr>
<tr><td>3</td><td>Knowledge of the effects of shift work is evident but there are occasional inaccuracies/omissions. There is some effective discussion. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is mostly used appropriately.</td><td>7–9</td></tr>
<tr><td>2</td><td>Limited knowledge of the effects of shift work is present. Any discussion is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is occasionally used appropriately.</td><td>4–6</td></tr>
<tr><td>1</td><td>Knowledge of the effects of shift work is very limited. Discussion is limited, poorly focused or absent. The answer as a whole lacks clarity, has many</td><td>1–3</td></tr>
</table>
</td><td>12

AO1 = 6
AO3 = 6</td></tr>
</table>

		inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used.	
	0	No creditable content.	**0**

Section B: Schizophrenia **Total for this section: 30 marks**

Question	Marking guidance	Total marks
05	**Identify an example of each of the following symptoms of schizophrenia shown by Erika.** Award **1 mark** for each correctly identified example. **Content:** Avolition – "(…wants to go to college to study but often) sits at home doing nothing all day." Delusion – "…believes are the thoughts of other people." Hallucination – "…hear voices in her head…" Speech poverty – "…rarely responds."	**4** **AO2 = 4**

Question	Marking guidance	Total marks
06	**Explain one strength and one limitation of cognitive therapy as a therapy for schizophrenia.** **Possible Strengths:** • Use of supporting evidence for effectiveness eg Morrison *et al.* (2014) Drury et al. (1996) etc. • Useful in helping to treat delusional thinking which can increase adherence to drug regime. • Places the patient in charge of dealing with their schizophrenia. • No/minimal side effects compared to drug treatment, decreasing dropout rates. Credit other relevant strengths	**3 + 3** **AO3 = 6**

Level	Description	Marks
3	Strength is detailed and appropriate. The answer is clear with appropriate use of specialist terminology.	**3**
2	Strength is relevant but detail is lacking. The answer lacks clarity in places.	**2**
1	Strength is limited. The answer is vague/muddled.	**1**
0	No creditable content.	**0**

Possible Limitations:
- CBT requires self-awareness and willingness to engage with process which some people with schizophrenia lack.
- Not all clients are suited to vigorous confrontation.
- Not effective in treating all schizophrenic symptoms and so not effective for all patients with schizophrenia.

	• Requires a course of sessions which may lead to drop out especially at times of severe psychotic episodes. • CBT has been criticised for attempting to control patients' thoughts which may interfere with an individual's freedom of thought. Credit other relevant limitations **Level** / **Description** / **Marks** **3** – Limitation is detailed and appropriate. The answer is clear with appropriate use of specialist terminology. – **3** **2** – Limitation is relevant but detail is lacking. The answer lacks clarity in places. – **2** **1** – Limitation is limited. The answer is vague/muddled. – **1** **0** – No creditable content. – **0**	

Question	Marking guidance	Total marks
07	**Describe and evaluate two biological explanations for schizophrenia.** **Possible Description:** Genetics • Schizophrenia is hereditary. • Family, twin and adoption studies confirm that schizophrenia tends to cluster in families, eg identical twins have a higher concordance and adopted children have higher incidence if one or more of their natural parents has schizophrenia. • Candidate genes – research suggests schizophrenia is polygenic; genes associated with increased risk include those coding for neurotransmitters such as dopamine. Neural Correlates • Dopamine hypothesis – reduced dopamine in the frontal area of the brain might be causing negative symptoms whilst increased dopamine in other areas might be responsible for the positive symptoms. • Glutamate hypothesis – glutamate activity has been found to be reduced in people with schizophrenia and this is linked to the NMDA receptors working less effectively. Glutamate acts to reduce dopamine, therefore if glutamate is reduced this will increase dopamine levels and result in schizophrenic symptoms. • Changes in the structure of the brain might be correlated to behavioural changes seen in schizophrenia, eg negative correlation between activity levels in the ventral striatum and the severity of overall negative symptoms, reduced activity in the superior temporal gyrus and the anterior cingulate gyrus is a neural correlate of the positive symptoms etc.	**20** **AO1 = 8** **AO3 = 12**

Possible Evaluation:

- Use of supporting evidence eg Gottesman & Shields (1966 and 1982), Kety et al. (1968), Tienari et al. (1994), Ripke et al. (2014), Kim et al. (1980), Juckel et al. (2006) etc.
- Issues with research where linked back to biological explanations for schizophrenia, eg twin studies have used small samples and evidence suggests that MZ twins are reared in a more similar environment than DZ twins, and therefore nurture might partly explain the higher concordance rate found for MZ twins.
- Supporting evidence from the success of antipsychotic drugs which block dopamine receptors and help to reduce symptoms.
- Oversimplification of the dopamine hypothesis. Many neurotransmitter systems interact and that the mapping of these cortical pathways needs further investigation.
- Unreliable findings – Lewis (1990) reviewed 18 studies and found no significant link between enlarged ventricles and negative symptoms associated with schizophrenia.
- A variety of brain mechanisms seem to be implicated in schizophrenia, but none are yet sufficiently understood to provide a causal link.
- Reductionist – environmental risk factors are implicated in the onset of schizophrenia and it is likely that biological factors only contribute partially towards the development of schizophrenia.

Credit other relevant material.

Level	Description	Marks
4	Knowledge of biological explanations is mostly accurate and generally well detailed. Evaluation is mostly effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear and focused. Specialist terminology is mostly used effectively.	**16–20**
3	Knowledge of biological explanations is evident but there are occasional inaccuracies/omissions. There is some effective evaluation. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is mostly used appropriately.	**11–15**
2	Limited knowledge of biological explanations is present. Any evaluation is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is occasionally used appropriately. Or one explanation at Level 3/4.	**6–10**
1	Knowledge of biological explanations is very limited. Evaluation is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used. Or one explanation at Level 1/2.	**1–5**

	0	No creditable content.	**0**

Section C: Research Methods 2 **Total for this section: 30 marks**

Question	Marking guidance	Total marks
08	**Briefly outline what is meant by an aim.** Award marks as follows: **1 mark** for a clear outline of an aim. **Content:** • A sentence describing the purpose of the study/what the study intends to investigate.	**1** **AO1 = 1**

Question	Marking guidance	Total marks
09	**Identify the aim of this study.** Award marks as follows: **1 mark** for a clear identification of the aim. **Possible content:** • To investigate problem-solving skills in language students. Credit other relevant content.	**1** **AO2 = 1**

Question	Marking guidance	Total marks
10	**Briefly outline what is meant by a hypothesis.** Award marks as follows: **1 mark** for a clear outline of a hypothesis. **Content:** • A (testable) statement to predict what will happen in an investigation.	**1** **AO1 = 1**

<table>
<tr><th>Question</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>11</td><td>
Write an appropriate hypothesis for this study.

Possible Content:
• Language students will take (significantly) less time to solve (five) verbal problems than the time taken to solve (five) numerical problems.
• Language students will take (significantly) more time to solve (five) numerical problems than the time taken to solve (five) verbal problems.

No marks for non-directional hypothesis.

Can credit null hypothesis.

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>3</td><td>For an appropriate directional hypothesis with both the IV and DV operationalized.</td><td>3</td></tr>
<tr><td>2</td><td>For an appropriate directional hypothesis that lacks clarity or where only the IV or DV is operationalized.</td><td>2</td></tr>
<tr><td>1</td><td>For a muddled directional hypothesis.</td><td>1</td></tr>
<tr><td>0</td><td>No creditable content.</td><td>0</td></tr>
</table>
</td><td>3

AO2 = 3</td></tr>
</table>

<table>
<tr><th>Question</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>12</td><td>
Identify the type of experimental method used in this study. Explain your answer.

1 mark for correctly identifying laboratory.

PLUS

1 mark for an explanation, eg the experiment is carried out in a controlled environment (at a university).
</td><td>2

AO2 = 2</td></tr>
</table>

<table>
<tr><th>Question</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>13</td><td>
Explain one strength of the type of experimental method you identified in your answer to Question 12.

Possible strengths:
• High level of control of extraneous variables.
• High degree of replicability.
• Cause and effect can be established.

Credit other relevant strengths.
<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>3</td><td>Strength is detailed and appropriate. The answer is clear with appropriate use of specialist terminology.</td><td>3</td></tr>
<tr><td>2</td><td>Strength is relevant but detail is lacking. The answer lacks clarity in places.</td><td>2</td></tr>
<tr><td>1</td><td>Strength is limited. The answer is vague/muddled.</td><td>1</td></tr>
<tr><td>0</td><td>No creditable content.</td><td>0</td></tr>
</table>
</td><td>3

AO3 = 3</td></tr>
</table>

<table>
<tr><th>Question</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>14</td><td>
Use the data in Table 1 to calculate the mean time taken to solve the problems for each condition. Show your workings.

<u>Condition 1</u>

2 marks for a correct answer = 137
1 mark for incorrect or absent answer but correct workings, eg (134+123+68+134+230+102+269+134+74+102)/10

<u>Condition 2</u>

2 marks for a correct answer = 208
1 mark for incorrect or absent answer but correct workings, eg (167+235+109+178+209+198+358+103+289+234)/10
</td><td>4

AO2 = 4</td></tr>
</table>

Question	Marking guidance	Total marks
15	**Which of the following ways of presenting data would be the most appropriate way of displaying the means for each condition? Shade one box** Answer = A (Bar chart)	**1** **AO2 = 1**

Question	Marking guidance	Total marks
16	**Identify an appropriate statistical test which could be used to analyse the results of this study. Give three reasons why the test you have chosen would be suitable in this case.** **1 mark** for naming related t-test. **PLUS** **1 mark** for each reason as follows: • Interval data as time taken (in seconds) is from a safe numerical scale of equal intervals. • The experimental design is repeated measures as participants take part in both conditions. • The researcher is looking for a difference in the time taken to complete the verbal and numerical problems.	**4** **AO2 = 4**

Question	Marking guidance	Total marks
17	**Briefly outline what is meant by demand characteristics.** Award marks as follows: **1 mark** for a clear outline of demand characteristics. **Possible Content:** • A cue from the researcher/research situation which may be interpreted by the participant as revealing the aim of the investigation.	**1** **AO1 = 1**

<table>
<tr><th>Question</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>18</td><td>
Explain how demand characteristics could have affected the validity of this study.

Possible Content:
• As this was a repeated measures design, participants would have been aware of the two types of problems – verbal and numerical.
• As the students were studying languages they may have assumed that they should be quicker at verbal problem solving than numerical problem-solving and so may have unconsciously tried harder in condition 1.
• The results for condition 1 may have been better due to these assumptions/demand characteristics and not due to their linguistic ability/them being language students which would act as a confounding variable and lower validity.

Credit other explanation.

<table>
<tr><th>Level</th><th>Description</th><th>Marks</th></tr>
<tr><td>3</td><td>Explanation is detailed and appropriate. The answer is clear with appropriate use of specialist terminology.</td><td>3</td></tr>
<tr><td>2</td><td>Explanation is relevant but detail is lacking. The answer lacks clarity in places.</td><td>2</td></tr>
<tr><td>1</td><td>Explanation is limited. The answer is vague/muddled.</td><td>1</td></tr>
<tr><td>0</td><td>No creditable content.</td><td>0</td></tr>
</table>
</td><td>3

AO2 = 3</td></tr>
</table>

Question	Marking guidance	Total marks
19	**Briefly explain one way that the researcher could have reduced the chances of demand characteristics in this study.** **2 marks** for a clear explanation. **1 mark** for a limited/vague/muddled explanation. **Possible Content:** • The researcher could have used an independent groups/matched pairs design and only make participants aware of the condition they took part in. • The researcher could deceive the participants by not telling them that they are going to be timed when solving the problems. Credit other relevant content.	**2** **AO2 = 2**

Question	Marking guidance	Total marks
20	**Explain how the researcher could use content analysis to analyse the problem-solving diaries.** **Possible Content:** • The researcher would need to develop a coding system to categorise and quantify the content of the problem-solving diaries. • Examples of the coding system could include the number of verbal problems solved each day; the number of numerical problems solved each day; etc. • The researcher would then work through the problem-solving diaries and record all instances of any example used in the coding system. • Once the data has been coded, the researcher may also conduct a thematic analysis identifying recurrent themes within the problem-solving diaries.	**4** **AO2 = 4**

Level	Description	Marks
2	Explanation has some detail. The answer is clear with appropriate use of specialist terminology.	**3–4**
1	Explanation is limited, vague or muddled. Specialist terminology is either absent or inappropriately used.	**1–2**
0	No creditable content.	**0**

PS03 grid

	AO1	AO2	AO3	Total
Section A				
01	4			**4**
02.1		2		**2**
02.2	3			**3**
03	4		5	**9**
04	6		6	**12**
Section B				
05		4		**4**
06			6	**6**
07	8		12	**20**
Section C				
08	1			**1**
09		1		**1**
10	1			**1**
11		3		**3**
12		2		**2**
13			3	**3**
14		4		**4**
15		1		**1**
16		4		**4**
17	1			**1**
18		3		**3**
19		2		**2**
20		4		**4**
Unit total	**28**	**30**	**32**	**90**