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Cambridge Assessment International Education

Cambridge International AS & A Level

PSYCHOLOGY **9990/21**

Paper 2 Research methods **May/June 2023**

MARK SCHEME

Maximum Mark: 60

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the May/June 2023 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Social Science-Specific Marking Principles (for point-based marking)

1 Components using point-based marking:

- Point marking is often used to reward knowledge, understanding and application of skills. We give credit where the candidate's answer shows relevant knowledge, understanding and application of skills in answering the question. We do not give credit where the answer shows confusion.

From this it follows that we:

a DO credit answers which are worded differently from the mark scheme if they clearly convey the same meaning (unless the mark scheme requires a specific term)

b DO credit alternative answers/examples which are not written in the mark scheme if they are correct

c DO credit answers where candidates give more than one correct answer in one prompt/numbered/scaffolded space where extended writing is required rather than list-type answers. For example, questions that require *n* reasons (e.g. State two reasons …).

d DO NOT credit answers simply for using a 'key term' unless that is all that is required. (Check for evidence it is understood and not used wrongly.)

e DO NOT credit answers which are obviously self-contradicting or trying to cover all possibilities

f DO NOT give further credit for what is effectively repetition of a correct point already credited unless the language itself is being tested. This applies equally to 'mirror statements' (i.e. polluted/not polluted).

g DO NOT require spellings to be correct, unless this is part of the test. However spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. Corrasion/Corrosion)

2 Presentation of mark scheme:

- Slashes (/) or the word 'or' separate alternative ways of making the same point.
- Semi colons (;) bullet points (•) or figures in brackets (1) separate different points.
- Content in the answer column in brackets is for examiner information/context to clarify the marking but is not required to earn the mark (except Accounting syllabuses where they indicate negative numbers).

3 Annotation:

- For point marking, ticks can be used to indicate correct answers and crosses can be used to indicate wrong answers. There is no direct relationship between ticks and marks. Ticks have no defined meaning for levels of response marking.
- For levels of response marking, the level awarded should be annotated on the script.
- Other annotations will be used by examiners as agreed during standardisation, and the meaning will be understood by all examiners who marked that paper.

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Question	Answer	Marks
1	**Explain what is meant by the term 'ecological validity'. You may use an example in your answer.** 1 mark for explanation. 1 mark for detail (accept examples as detail). The extent to which the findings of a study set in one situation would generalise to other situations (explanation); E.g. whether findings from laboratory studies are relevant to life outside the laboratory (detail); Andrade's study in a laboratory may not represent attention in the real world where there are distractions (example);	**2**

Question	Answer	Marks
2	**In the study by Laney et al. (false memory), different types of items were used in the various questionnaires. Two of the items included:** • **rating items on a scale of 1-8 (from 'definitely did happen' to 'definitely did not happen')** • **multiple choice items where participants circled a price they would pay for different foods, e.g. $1.90, $2.50, or 'would never buy'.**	
2(a)	**Explain whether these items are both open questions, both closed questions, or one of each.** 1 mark for 'both closed'. 1 mark for justification (i.e. why they are closed). They are both closed (questions); They have fixed answer choices (justification); They don't allow the participants to elaborate their answer / give a description / answer in depth (justification); They cannot answer in words = 0. They cannot explain why = 0 (NAQ).	**2**
2(b)	**Laney et al. used a 'critical item' in the profile and in a questionnaire given to the experimental group.** **Explain what is meant by a 'critical item', using the example from Laney et al.** 1 mark for explanation. 1 mark for link/example. (A critical item is) the item/question that is related to the IV (explanation); The manipulation that enables data collection for the DV (explanation); The part of the procedure that directly related to the aim (explanation); (In Laney et al.) it is the inclusion of the asparagus comment in the love condition (link); 'You loved to eat cooked asparagus' (in the third position in the profile for 'love' condition participants) (link);	**2**

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Question	Answer	Marks
3	**In the study by Canli et al. (brain scans and emotions), a repeated measures design was used.**	
3(a)	**Explain what is meant by a 'repeated measures design'. Include an example from Canli et al. in your answer.** 1 mark for explanation of repeated measures. 1 mark for link. Every participant does all/both of the levels of the IV / conditions (emotive/negative and non-emotive/neutral) = 1 mark (explanation); Each participant saw stimuli at each level of (emotional) arousal (IV) (link);	**2**
3(b)	**Explain <u>one</u> strength of using a repeated measures design.** 1 mark for explanation of strength. 2nd mark for detail (can include an example). It overcomes problems with individual differences (explanation); So if people differ in important ways they will all be their own baseline, so it won't matter (detail); E.g. Yamamoto, if one chimp was more helpful than another (it would confound an independent measures design) (detail); E.g. if some participants in Canli et al. were just more emotional, it would even out (detail);	**2**

Question	Answer	Marks
4	**Explain <u>two</u> ways in which the procedure was standardised in the study by Yamamoto et al. (chimpanzee helping).** 1 mark for an aspect of standardisation } 1 mark for explanation/elaboration } ×**2** The tools were always presented on a tray (standardisation); So that the items were no more likely to be easy to find in any trial / for any chimpanzee (explanation); All chimps had a familiarisation task (standardisation); So that they were equally prepared for the tools needed for different tasks (explanation); Only difference between booths for 'can see' and 'cannot see' was whether the panel was transparent or opaque (stand); So the situation was the same each time, such as the hole they put the objects through (elaboration);	**4**

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Question	Answer	Marks
5	**Reliability refers to the consistency of tests, tasks or measures in research.** **Explain why reliability is important in experiments.** 1 mark for explanation. 2nd mark for detail (can include an example). If tests are inconsistent, differences between conditions might be due to poor measurement, not the IV (explanation); If the DV is not being measured reliably then the data cannot test a causal effect (explanation); E.g. if Bandura's observers were not reliable, differences between conditions might be due the scoring by observers, not the model conditions (linked detail); E.g. if Pepperberg was not consistent in her interpretation of Alex's utterances, the data could have been biased (linked detail); Because low reliability also lowers validity (explanation); I.e. the researcher cannot be sure that the IV and only the IV is affecting the DV (detail);	**2**

Question	Answer	Marks
6	**Describe the sampling techniques of 'opportunity sampling' and 'volunteer sampling', using any examples.** Definitions/detail: up to a maximum of 4 marks for each sampling technique. Examples: maximum of 2 marks for each sampling technique. Examples can include examples from any studies (core studies, other studies, candidate's own studies). Max 4 if no examples. Opportunity sampling: Using participants who are available at the time / finding participants by convenience; Passers-by/students in the researcher's class; Baron-Cohen et al. found participants in adult community education class (in Exeter) / (public) library (in Cambridge); Saavedra and Silverman child (and mother) in treatment (at Florida International University); Piliavin et al. subway passengers; Volunteer sampling: Using a request asking people to join in; By advert/email/post/online; Baron-Cohen et al. took volunteers from Autistic Society magazine / support group; Schachter and Singer used volunteers from the psychology course / University of Minnesota; Laney et al. used volunteers from a participant pool (at University of Washington);	**6**

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Question	Answer	Marks
7	**Steve is planning an experiment, using the technique of observation, to compare the level of frustration shown by shoppers in different types of shops. He has set up cameras to help measure the behaviour of shoppers in shops selling basic goods (things that are essential) and shops selling luxury goods (things that are not essential).**	
7(a)	**Steve is concerned that situational variables could be a problem in his study.**	
7(a)(i)	**Suggest <u>two</u> situational variables that could affect Steve's study.** 1 mark for a relevant situational variable ×**2** (No marks for participant variables). How busy the shop is / how many customers there are; How many staff there are; The music playing; If the shoppers are already frustrated = 0 (participant variable);	**2**
7(a)(ii)	**Explain how <u>each</u> of the situational variables that you suggested in (a)(i) could be a problem in Steve's study.** 1 mark for explanation of situational variable + 1 mark for detail ×2. How busy the shop is / how many customers there are: Being crowded may make the shoppers frustrated (explanation); This is important because if there is a difference it is due to crowds rather than the type of shop (detail); How many staff there are: If there are more staff they may get helped/served slower, making them frustrated; This is important because if there is a difference it is due to the number of staff not the type of shop (detail); The music playing: If the music playing in one type of shop is better/louder it may make them more or less frustrated; This is important because if there is a difference it is due to the music rather than the type of shop (detail);	**4**
7(b)	**Steve is also concerned about the ethics of his study.**	
7(b)(i)	**Suggest why the ethical guideline of right to withdraw would be difficult for Steve to follow in his study.** 1 mark for brief or unlinked answer. 1 mark for clear and linked answer (will include idea of 'being able to **leave**' (guideline) and 'leaving the **shop**' (Steve). Right to withdraw is the opportunity for participants to leave the study if they want to (unlinked) = 1; Steve's participants cannot leave the shop because they do not know they are in a study (linked) = 2.	**2**

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Question	Answer	Marks
7(b)(ii)	**Suggest why the ethical guideline of privacy would be difficult for Steve to follow in his study.** 1 mark for brief or unlinked answer. 2 marks for clear and linked answer: will include '**intrusion'** (guideline) and 'being seen doing **shopping/stealing'** (Steve). Privacy is participants who do not want to be seen or their behaviour observed (unlinked) = 1; Participants are unaware of the observation so may behave in ways they would **not want to be seen e.g. stealing** (linked) = 2; Participants have the right to private space/thoughts and may **not want to be seen buying expensive goods** (linked) = 2;	**2**

Question	Answer	Marks
8	**Leila is conducting a correlational study. She predicts that there will be a correlation between:** • **'success at learning a language'** • **'enjoyment of word puzzles', e.g. crosswords.**	
8(a)	**Suggest an objective measure of 'success at learning a language' that Leila could use. Justify your answer. Do <u>not</u> use a self-report rating scale.** 1 mark for measure of language learning. 1 mark for justification of objectivity. Vocabulary size (in new language) (measure); How many errors they make in verb conjugation (measure); This will be a numerical result so does not need interpretation (justification). How fluent they are assessed by their ability to complete a multiple choice test (measure); Each item on the test will only have one correct answer (justification);	**2**
8(b)	**Leila is measuring 'enjoyment of word puzzles' by asking participants to rate how much they enjoy word puzzles on a scale of 0 (not at all) to 5 (very much).** **Explain how Leila would calculate the median for 'enjoyment of word puzzles'.** 1 mark for linked explanation. Put all the **enjoyment** scores into (numerical) order (by value) and find the middle one = 1; Put all the scores into (numerical) order (by value) and find the middle one = 0 marks (could be learning scores);	**1**

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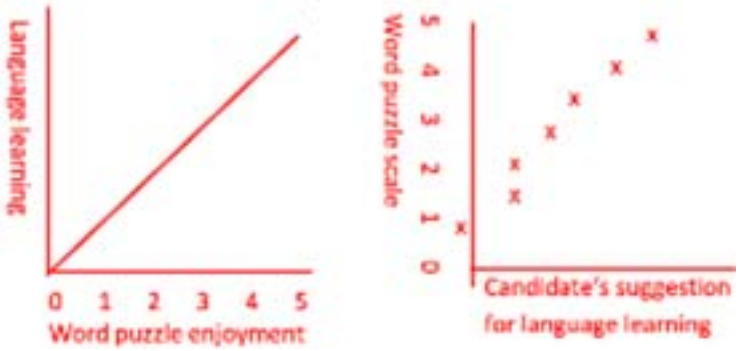
Question	Answer	Marks
8(c)	**Leila conducts her study. Her results show a positive correlation.** **Sketch a graph, using the axes below, to show the pattern of Leila's results.** **You <u>must</u> label the axes.** Award 1 mark for each of: • scatter graph (points or 'line of best fit') • positive slope (essential for 4 marks) • axis label: 'language learning (score)' OWTTE • axis label: 'enjoyment of word puzzles' OWTTE • axis scale for 'word puzzle' axis: 0-5  	**4**

Question	Answer	Marks
9	**Inma is conducting an experiment about learning. She predicts that animals will learn to find food in a maze faster in the light than in the dark. If the animal does not find the food after 10 minutes, they are given the food by the experimenter.**	
9(a)	**Inma is using a directional (one-tailed) hypothesis.** **Explain why Inma is using a directional hypothesis in her experiment.** 1 mark for a generic explanation. 2 marks for a linked explanation. Because she knows which way the results will go = 1 (generic); Because she believes that the animals will be faster (to learn the maze) in the light than the dark = +1 (linked);	**2**

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Question	Answer	Marks
9(b)	**Write a null hypothesis for Inma's experiment.** 1 mark for a null hypothesis. There will be no difference between speed in the maze in the light and in the dark = 1. Any difference between maze learning success in the light and in the dark is due to chance = 1. There will be no difference between maze learning success/speed and light and dark = 0. Any difference between maze learning success and light or dark is due to chance = 0.	**1**
9(c)	**Inma will use an independent measures design for her experiment.** **Explain <u>one</u> advantage of using an independent measures design compared to a repeated measures design.** 1 mark for generic advantage. 2 marks for advantage compared explicitly to repeated measures. The animals cannot suffer practice/fatigue/order effects = 1 (generic). The animals cannot suffer practice/fatigue/order effects (as don't do both levels of IV unlike in repeated measures) = 2. They will only experience one level of the IV = 1 (generic). They cannot suffer a practice/fatigue/order effect as they will only do the maze in the light or dark unlike repeated.measures = 2. The animals will not get better between conditions/levels of the IV = 1 (generic). The animals will not get better between doing the maze in the light and then in the dark unlike repeated measures = 2. The animals will not be affected (so much) by demand characteristics =1. Animals will not be affected (so much) by demand characteristics as they only experience one level of the IV = 1 (not explicit). Animals will not be affected (so much) by demand characteristics as they will only do the maze in the light or dark unlike repeated measures = 2.	**2**

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Question	Answer	Marks
9(d)	**Explain how Inma followed <u>one</u> ethical guideline in relation to animals.** 1 mark for identifying relevant guideline. 1 mark for explanation of how Inma is following it. Reward; Animals are being given a food reward for reaching the middle of the maze / are not punished if they don't (explanation). Housing (guideline); Animals are being fed (within at least 10 minutes) (explanation). Pain and distress (guideline); Animals are not suffering, only finding their way through a maze (and getting fed) (explanation). Deprivation (and aversive stimuli) (guideline); Animals are not deprived as they get food whether they reach the middle of the maze or not (explanation).	**2**

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Question	Answer	Marks
10	**Dr Clare is planning an observational study of student behaviour in a library at a university. She will be the only observer. She is interested in student behaviours such as:** **• how they study** **• how they find books** **• what they do in the library other than studying** **• how long they spend in the library.**	
10(a)	**Describe how Dr Clare could conduct an observational study to investigate the behaviour of students in a library at a university.** Three **majors** for an **observational study** are: **(a) [what] behaviours** - that will be recorded, e.g. two named (detail e.g. definition / operationalisation of behavioural categories); **(b) [how]** identification of first **observational technique** (detail: how achieved): • structured/unstructured • participant/*non-participant* (not interacting with students; sitting at back of library/upstairs) • *naturalistic*/controlled (do **not** interfere, ask Qs, help finding books etc) • *covert*/overt (hidden/unaware; librarian/stooge student). **(c) [how]** further/additional **observational techniques** (detail: how achieved, in at least one further case): • *participant*/non-participant (participant – librarian/stooge student) • naturalistic/**controlled** (stooge ask for help to find books, stooge tries to engage them in in non-studying) • *covert*/overt. The **minors** are: **where** – location of participants when data is collected (*university library)* **who** – participants *(students)* **when** – data is collected. Other details for replication: • sampling technique • sample size • description of how data will analysed, e.g. use of measures of central tendency and spread, bar charts • ethical issues.	**10**

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Question	Answer	Marks
10(a)	Other appropriate responses should also be credited. Mark according to the levels of response criteria below: **Level 3 (8–10 marks)** • Response is described in sufficient detail to be **replicable**. • Response may have a minor omission. • Use of psychological terminology is accurate and comprehensive. **Level 2 (5–7 marks)** • Response is in some detail. • Response has minor omission(s). • Use of psychological terminology is accurate. **Level 1 (1–4 marks)** • Response is basic in detail. • Response has major omission(s). • If response is impossible to conduct max. 2. • Use of psychological terminology is mainly accurate. **Level 0 (0 marks)** No response worthy of credit.	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>10(b)</td><td>
Identify <u>one</u> practical weakness/limitation with the procedure you have described in your answer to part (a) and suggest how your study might be done differently to overcome the problem.

Do <u>not</u> refer to ethics or sampling in your answer.

Answer will depend on problem identified.

Problems may, for example, be matters of:

Validity
• operationalisation
• situational/participant variables factors.

Reliability
• inter-rater consistency
• intra-rater consistency.

This list is not exhaustive and other appropriate responses should also be credited.
<table>
<tr><th>Marks</th><th>Comment</th></tr>
<tr><td>3–4</td><td>Appropriate problem identified.
Appropriate solution is clearly described.</td></tr>
<tr><td>2</td><td>Appropriate problem identified.
plus
EITHER
Explanation of why it is a problem,
OR
Ineffectual but possible solution described.</td></tr>
<tr><td>1</td><td>Appropriate problem identified.
Little or no justification.</td></tr>
<tr><td>0</td><td>No response worthy of credit.</td></tr>
</table>
</td><td>4</td></tr>
</table>

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