Cambridge Assessment International Education

Cambridge International AS & A Level

PSYCHOLOGY **9990/21**

Paper 2 Research Methods **October/November 2022**

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 October/November 2022 series for most Cambridge IGCSE™, Cambridge International A and AS Level 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:

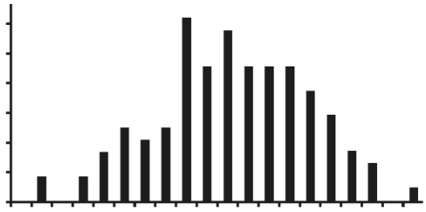
- For point marking, ticks can be used to indicate correct answers and crosses can be used to indicate wrong answers. There is no direct relationship between ticks and marks. Ticks have no defined meaning for levels of response marking.
- For levels of response marking, the level awarded should be annotated 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	**The study by Milgram (obedience) used a shock generator, which looked real.** **Explain why it was necessary that the shock generator looked real.** 1 mark identification of reason (may be generic) Ignore **REP** e.g. 'so they believed the situation was real'. 1 mark detail (must have link). To avoid demand characteristics / participants guessing the aim; (generic reason). Otherwise, participants might have gone to the full voltage / known they couldn't hurt anyone; (detailed link).	**2**

Question	Answer	Marks
2	**Bill has two groups of children in his study and writes a directional hypothesis. It states that 'Older children are more obedient than younger children'. He then decides that this might not be correct and uses a non-directional hypothesis instead.**	
2(a)	**Suggest a non-directional hypothesis for Bill's study.** 1 mark for non-directional hypothesis (must be a testable statement, not an aim, not a question). Older and younger children will differ in their obedience; Children of different ages will have different levels of obedience; There is a difference in obedience between younger and older children; There will be a correlation/relationship between age and obedience = 0 [not experimental] There will be no difference/correlation between age and obedience = 0 [null]	**1**
2(b)	**State how Bill will find the mode for the age of the group of younger children.** 1 mark for how to find mode (linked). Find the most frequent age of (all) the (young) children (in years/months) = 1	**1**
2(c)	**Suggest <u>two</u> reasons why it could be ethically more difficult to measure obedience in children than in adults.** 1 mark for reason ×2. 1 mark for link to obedience. Children cannot consent / are too young to give informed consent; (reason) So, they might not know what 'obedience' means (so wouldn't know what they were agreeing to); (link) Children are more at risk of harm / unaware of the risks / vulnerable to pressure from adults / more easily upset than adults; (reason) So may follow orders / be obedient even though it will upset them; (link) This would put them at risk of harm as they may be obedient when they really don't want to be; (link) Children may not be able to exercise their right to withdraw; (reason) As they are taught to be obedient to adults; (link).	**4**

Question	Answer	Marks
3	**Describe <u>two</u> features of a laboratory experiment. Use a different example from the study by Schachter and Singer (two factors in emotion) for each feature.** 1 mark per feature ×2. 1 mark per link to Schachter and Singer study [can get this mark without the feature mark]. Has a manipulated independent variable; (feature) They changed anger or euphoria (with a stooge) / changed adrenalin or saline (by injection) / INF or MIS INF; (link) Has a measured dependent variable; (feature) They scored angry or euphoric behaviour; (link) Has controls/standardisation; (feature) The stooge was scripted; (link) Injection (of saline/adrenalin) seemed the same; (link).	**4**

Question	Answer	Marks
4	**Baron-Cohen et al. (eyes test) presented the eyes test results on a graph showing the percentage of participants who gained each score. The graph is shown in Fig. 1.**	
4(a)	**Label the axes on Fig. 1, using the answer spaces below.**  1 mark for correct X-axis label = 'Eyes Test (score)' 1 mark for correct Y-axis label = 'Percentage of participants/subjects'	**2**
4(b)	**Name the type of distribution shown in Fig. 1.** Normal (distribution) = 1 mark (definitive).	**1**

Question	Answer	Marks
5	**Participants in a study are learning to throw a ball through a hoop.** **Suggest how the variable of 'learning' could be operationalised in this study.** 1 mark for operational definition of operant conditioning of learning to throw a ball through a hoop. Their accuracy of getting the ball through the hoop increases; How many balls go through the hoop on each trial; How fast they can get (10) balls through the hoop; How many minutes it takes *before* they get balls into the hoop accurately.	**1**

Question	Answer	Marks
6	**Describe the ethical guidelines of 'species and strain' and 'numbers' in relation to animals, using any examples.** Definitions/detail: up to a maximum of 4 marks for each guideline. Examples: maximum of 2 marks for each guideline. Examples can be from any studies (core studies, other studies, candidate's own studies). Max. 4 if no examples or if only one type of the guidelines is described. Species and strain: The species/strain which is least likely to become distressed should be chosen; That is able to fulfil the requirements of the study (i.e. it is a compromise); Each species has different needs e.g. for warmth / cover / space for exercise / to avoid overcrowding; The needs of each species may differ with age / sex / reproductive stage; Don't use endangered species; e.g. Pepperberg used a parrot, which is a domesticated species so not distressed by human interaction; e.g. Yamamoto et al. needed to use chimpanzees which may be distressed as helping is a complex concept. Number: The smallest number of animals possible should be used (so that the smallest number of animals experience harm/distress); However, enough should be used to achieve valid/reliable results; e.g. Pepperberg only used 1 parrot / only Alex (which is good); e.g. Yamamoto et al. only used 5 / a small number of chimpanzees (which is good).	**6**

Question	Answer	Marks
7	**Kate is using a questionnaire to investigate how participants could feel about people who are older than them. The emotions she is investigating are:** • **boredom** • **empathy** • **fear** • **happiness.**	
7(a)(i)	**Kate needs to define each of these emotions.** **Suggest how Kate could operationalise <u>two</u> of the emotions that she is investigating.** 1 mark for operationalisation ×2 [Accept definition, operationalisation or measure] Does not have to be linked. boredom = (finding an older person) dull / uninspiring / not interesting; empathy = understanding feelings (how the older person feels); fear = being scared / worrying (that the older may harm you); happiness = feeling positively (about the older person). These are examples, there will be many acceptable definitions.	**2**
7(a)(ii)	**For <u>one</u> of your suggestions in (a)(i):** **Explain why Kate could misinterpret this emotion when gathering data in her study.** 1 mark for explanation must be of one of the emotions from 7(a)(i) (NO mark for restating emotion). *boredom = dull:* The participants might be bored themselves, so appear to find the older person boring; *empathy = understand feelings:* The participants could be pretending to understand e.g. out of courtesy; *fear = worry:* Fear might alternatively be based on worry for or about someone or something other than yourself; *happiness = feeling positive:* Participants may be happy for some other reason, so appear to be linking happiness with the older person.	**1**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>7(b)</td><td>Kate measures how strongly the participants feel each emotion about people who are older than them, using a score from 0–10.</td><td></td></tr>
<tr><td>7(b)(i)</td><td>Kate wants to find the median ‘happiness’ score. Outline how to find a median score.

1 mark for explanation (can be generic).

Put all the (happiness) scores in rank order / in a list from biggest to smallest, the middle one is the median;

Find the middle number of the scores in rank order;

Find the middle number of the scores = 0</td><td>1</td></tr>
<tr><td>7(b)(ii)</td><td>Kate wants to use a graph to plot the median results for each of the four emotions.

Name the <u>most</u> appropriate type of graph for Kate to use.

1 mark for identification of bar chart/bar graph (definitive).</td><td>1</td></tr>
<tr><td>7(b)(iii)</td><td>Kate calculated the standard deviation of scores for each emotion. The standard deviations are shown in Table 1.

Table 1

<table><tr><th>Emotion</th><th>boredom</th><th>empathy</th><th>fear</th><th>happiness</th></tr><tr><td>Standard deviation</td><td>1.4</td><td>3.2</td><td>2.2</td><td>2.6</td></tr></table>
Explain which emotion had the widest spread of scores.

1 mark for identification of ‘empathy’ (definitive).
1 mark for explanation (can be generic).

Empathy; (identification)
Because this has the largest/highest standard deviation (showing these scores had the most variation/dispersion); (explanation)
Because 3.2 is the biggest; (explanation).</td><td>2</td></tr>
</table>

Question	Answer	Marks
8	**Gill is planning a structured interview about disruptions to sleep patterns. She is investigating the effects of work, sport and family. She begins by writing four questions:** **A Describe how your sleep pattern changes when extra family members stay for the night.** **B How long do you sleep after you have participated in sport compared to when you have not participated in sport? More time / less time.** **C Is your sleep quality in the week compared to the weekend better, worse or about the same?** **D Explain how any other factors affect your sleep patterns.**	
8(a)	**Identify <u>one</u> closed question from A to D.** 1 mark for B or C (definitive). **Accept** responses that have copied out the question instead of giving a letter.	**1**
8(b)	**Identify <u>one</u> open question from A to D.** 1 mark for A or D (definitive). **Accept** responses that have copied out the question instead of giving a letter.	**1**

Question	Answer	Marks
8(c)	**Gill plans two more questions to use in her structured interview:** **E Is your sleep better or worse if you eat a meal close to bedtime? Better / worse.** **F Explain how your sleep pattern is affected if you work at night.** **Suggest <u>one</u> problem that Gill could have when using <u>one</u> of the new questions.** 1 mark for identification of problem (may be generic). 1 mark for link. NO mark for stating E or F. (**E**) Is your sleep better or worse if you eat a meal close to bedtime? Better / worse: • (Because it is a closed question) the choices are limited / the response offers little understanding; (generic problem) • They may want to say 'it makes no difference' but this isn't possible; (link) • (Because it is a closed question) they can't elaborate their answer; (generic problem) • Participants may want to say 'it depends on what / how much I eat' but couldn't; (link) (**F**) Explain how your sleep pattern is affected if you work at night: • (Because it is an open question) their answer could need interpretation; (generic problem) • (Because it is an open question) the researcher could be subjective in understanding their answer; (generic problem) • If they say 'I don't do shift work very often so the effect is minor', Gill won't know what the effect is; (link) • (invasion of) privacy; (generic problem)	**2**
8(d)	**Gill's friend reads the six questions and says it would be better if she conducted a semi-structured interview instead of her structured interview.**	
8(d)(i)	**Explain what makes Gill's interview a structured interview.** 1 mark for only fixed questions / cannot ask extra questions / questions the same for all participants = 1	**1**
8(d)(ii)	**Suggest how Gill could change her structured interview into a semi-structured interview.** 1 mark for suggestion. Gill would make up new questions for each participant = 1 Use questions based on what (each) participant said / make up new questions that follow on (from their answers) = 1	**1**

Question	Answer	Marks
8(e)	**Gill notices that people who look like they have not slept well often refuse to take part in the study.** **Explain how this problem could affect the results of Gill's study.** 1 mark for correct use of a term (e.g. low validity, sample bias, unrepresentative or less generalisable). 1 mark for identification of the nature of the problem. 1 mark for link explaining the effect on the results. This makes the sample biased / unrepresentative / lowers validity / lowers generalisability; (term) The participants/results will all be very similar; (generic problem) Participants with poor sleep will be less frequent in the sample (than in the whole population); (problem) (Using only people with good sleep) will make it seem that people sleep better than they really do; (linked effect).	**3**

Question	Answer	Marks
9	**Manas is a researcher at a drug company and is conducting an experiment to test a new drug for patients who have phobias. The drug is a clear, tasteless liquid that should help the patients to relax during therapy. Manas selects 10 patients who will take the new drug and 10 other patients who will be given water, which is also clear and tasteless. The patients in both groups believe they are taking the new drug.**	
9(a)	**Identify the experimental condition <u>and</u> the control condition in this experiment.** 1 mark for identifying both conditions (definitive answers). Answers MUST be in the correct space (unless unambiguously indicated otherwise). experimental condition = (10 patients being given) the (new) drug control condition = (10 patients being given) water/placebo.	**1**
9(b)	**Manas has controlled two variables. The drug is:** • **a clear liquid** • **tasteless**	
9(b)(i)	**Suggest <u>two</u> other controls that could be used in this experiment to keep the experimental condition and the control condition as similar as possible.** 1 mark for a control ×2. The liquids should be labelled / presented in the same way (e.g. both in a beaker); Taken at the same temperature; The drug should have no smell / smell like water; The liquids should look/taste the same = 0 marks (repetition from stem).	**2**
9(b)(ii)	**Explain why it is important to keep the experimental condition and the control condition as similar as possible.** 1 mark for generic explanation of the purpose of controls. To ensure that any differences / changes in the DV (phobia reduction) are due only to the IV (the drug).	**1**

Question	Answer	Marks
9(c)	**Suggest <u>two</u> ethical problems with this experiment.** 1 mark for identification of problem ×2. 1 mark for link. Informed consent; (problem) Because the participants do not know whether they are receiving the drug or not; (link) Participants must not know whether they are receiving the drug or not, so they cannot give fully informed consent = 2 Deception / they are being lied to; (problem) they may believe they are getting the drug, which will not be true if they are in the control group; (link) Protection from harm (physical) / it might be dangerous; (problem) participants in the drug group may be physically harmed by the drug as it is still being tested; (link) Protection from harm (psychological); (problem) control participants may suffer in therapy if they try too hard if they think they are getting the drug; (link) control participants may not make progress in therapy because they are only getting water; (link).	**4**

Question	Answer	Marks
10	**Dr Angelo wants to investigate how young children respond when their teachers are helpful. She has seen teachers being helpful to children in the classroom and in the playground.**	
10(a)	**Describe how Dr Angelo can conduct an observational study to investigate the behaviour of children when their teachers are helpful.** Three majors for an observational study are: (a) behaviours – that will be recorded e.g. two named (detail e.g. definition/operationalisation of behavioural categories) if structured. (b) observational technique – participant/*non-participant* (not interacting with children; sitting away from class at back of room) • naturalistic/*controlled* (teacher helps by giving pointers on questions; to every child / every 5 mins) • *covert* (hidden/unaware; dinner ladies / classroom assistant) / overt (c) further observational technique: • *participant*/non-participant (detail: how achieved, in one further case) • *naturalistic*/controlled • covert/*overt* The minors are: location of participants when data is collected (*classroom*/*playground)* participants *(school children)* Also: • sampling technique • sample size • description of how tallying will be done • description of how data will be analysed, e.g. use of averages / bar charts • ethical issues Other appropriate responses should also be credited.	**10**

Question	Answer	Marks
10(a)	Mark according to the levels of response criteria below: **Level 3 (8–10 marks)** • Response is described in sufficient detail to be replicable (i.e. what and how). • Response may have a minor omission (i.e. who or where). • Use of psychological terminology is accurate and comprehensive. **Level 2 (5–7 marks)** • Response is in some detail. • Response has minor omission(s) (i.e. who and/or where). • 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.	

<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 not refer to ethics or sampling in your answer.
Answer will depend on problem identified. If the problem was an obvious omission in (a), fewer marks will have been awarded in (a), so they can be awarded here.

Problems may, for example, be matters of:

Validity:
• operationalisation
• difficulty with lying / social desirability
• difficulty with response biases

Reliability:
• inter-rater consistency
• intra-rater consistency

This list is not exhaustive and other appropriate responses should also be credited.</td><td>4</td></tr>
<tr><td>10(b)</td><td><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></td></tr>
</table>