Cambridge Assessment International Education

Cambridge International AS & A Level

PSYCHOLOGY **9990/22**

Paper 2 Research Methods **February/March 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 February/March 2022 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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.

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.

Question	Answer	Marks
1	**The study by Andrade (doodling) was a laboratory experiment. One feature of a laboratory experiment is that it has controls to limit the effect of extraneous variables.**	
1(a)	**State <u>two</u> other features of a laboratory experiment.** 1 mark per feature ×**2** **Manipulated** independent variable / conditions / levels; **Measured** dependent variable; Conducted in an artificial environment (for the behaviour being studied) / not the participant's usual/normal/natural environment / uses (scientific) equipment; **Note**: consequences/strengths/weaknesses of the lab experiment as a method are not features, e.g. high validity = 0 [irrl] Closed/controlled setting = 0 [ignore]	**2**
1(b)(i)	**Suggest <u>two</u> controls that were important in this study.** 1 mark per control identified ×**2** Volume (comfortable for each participant); Message was recorded / heard same message / message same length / message 2.5 minutes long; **All**/both groups participants had paper;	**2**
1(b)(ii)	**For <u>one</u> of the controls you suggested in (i):** **Explain how the results could have been affected if this control had <u>not</u> been used.** 1 mark for reason for the effect of the control *Volume (control):* **an unclear message would be harder to remembe**r; (effect on results) *Message was recorded (control):* **faster message would be harder to remember**; (effect on results) *Length of message (control):* **a shorter message could better/worse recall**; (effect on results)	**1**

Question	Answer	Marks
2	**A study has the experimental hypothesis 'There will be a gender difference in aggression'. This is a non-directional hypothesis rather than a directional hypothesis.**	
2(a)	**Explain what makes this a 'non-directional hypothesis'.** 1st mark for definition of non-directional hypotheses 2nd mark for explaining that it says 'gender' not **which** gender/sex will be more aggressive Because it (only) says there will be a **difference** = 1 (definition) Because it only says that males and females will be **different** = 1 (definition) It should say which sex is **more** aggressive in order to be directional = 2 (definition and explanation) It is non-directional as it says 'difference' but would say men were **more** aggressive than women = 2 (ORA) It doesn't state which sex would be **more** aggressive and would if it was directional = 2 It should say which sex is more aggressive = 0 (because not clear whether this means 'if it were directional') A non-directional hypothesis does not state the direction of the effect/results/difference = 0 [REP] References to correlational hypotheses are irrelevant [ignore them]	**2**
2(b)	**Write a null hypothesis for this study.** 1 mark for null hypothesis (does **not** have to be operationalised) There will be no gender difference in aggression; Any gender difference in aggression is due to chance; There is no difference between gender and aggression **= 0** Any difference between gender and aggression is due to chance **= 0**	**1**

Question	Answer	Marks
3	**In the study by Pepperberg (parrot learning), Alex the parrot was the only participant.**	
3(a)	**Explain <u>one</u> advantage of using one participant in this study.** 1 mark for advantage 1 mark for link **must be (parrot)-study-related** The **ethical guideline of 'numbers'** says use as few as possible; (advantage) This means only one parrot was exposed to the tests / was confined; (link) Can study one participant in depth; (advantage) e.g. time taken to train Alex; (link)	**2**
3(b)	**Explain <u>one</u> disadvantage of using one participant in this study.** 1 mark for disadvantage 1 mark for link Limits generalisability; (disadvantage) If Alex was very **clever** the results would not apply to other parrots; (link) (Alex was a **captive** bird so) the results may not apply to **wild** parrots; (link)	**2**

Question	Answer	Marks
4	**State <u>two</u> features of a normal distribution.** 1 mark for each feature ×2 It is symmetrical; 50% of scores either side (of 'middle') It is highest in the middle with tails at each side / bell-shaped; The mean is at the highest point; The median is at the highest point; The mode is at the highest point; The mean, median and mode are all the same;	**2**

Question	Answer	Marks
5	**In the study by Yamamoto et al. (chimpanzee helping), the results included how often the helper's first tool offer was a stick. The percentage of stick offers when a stick was needed and when a straw was needed could be displayed on a bar chart.** **Explain why a bar chart would be the <u>most</u> appropriate way to display these results.** 1 mark for categorical/discrete data / separate levels of the IV / IV not on a scale] 1 mark for identifying categories as stick offer when stick or straw needed The 'tool needed' (variable) was in two categories (of the IV), stick or straw needed (not a linear scale) = 2	**2**

Question	Answer	Marks
6	**Describe 'opportunity sampling' and 'random sampling', using any examples.** 1 mark for each definition, up to a maximum of 2, for each technique. 1 mark for each example that is linked to a technique. Examples can include examples from any studies (core studies, other studies, candidate's own studies). Max 4 if no examples. Max 4 if only about one type of sampling For example: *Opportunity sampling:* Using participants who are **available at the time**; 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 & Silverman child (& mother) in treatment (at Florida International University) Piliavin et al. subway passengers; *Random sampling:* Each individual in the population has an equal chance of being selected; getting a numbered list of people and putting the numbers in a hat / using a random number generator to select the sample by choosing out of a hat/the ones generated/from a random number generator; a study might use the list of all students in a school and select 30 from them;	**6**

Question	Answer	Marks
7	**Clark is a psychologist investigating whether the behaviours people dream about can be done in everyday life or not. He is monitoring participants' sleep in his laboratory and then interviewing them.**	
7(a)(i)	**Suggest <u>one</u> behaviour in dreams that Clark could ask about which can be done in everyday life. Your suggestion <u>must</u> be ethical.** 1 mark for identifying a possible behaviour Eating; Walking; Talking;	**1**
7(a)(ii)	**Suggest <u>one</u> behaviour in dreams that Clark could ask about which cannot be done in everyday life. Your suggestion <u>must</u> be ethical.** 1 mark for identifying a **behaviour** that cannot be done in everyday life Flying (unaided); Jumping over buildings; Reaching top branches of high tree from ground;	**1**
7(b)	**Clark believes that some participants may lie. For example, they may falsely report dream behaviours to impress Clark.** **Suggest <u>one</u> way that Clark could minimise this type of lying in his study.** 1 mark for suggestion 1 mark for link Use a **questionnaire** rather than an interview; (suggestion) They may be less compelled to report 'interesting' behaviours if they are not face-to-face; (link) Ask the question about impossible behaviours in **amongst other questions/fillers** (so they don't guess the aim / respond to demand characteristics); (suggestion) They may be less likely to realise they are being asked about impossible dream behaviours; (link) E.g. 'how busy have you been this week / do you eat oranges'; (link)	**2**

Question	Answer	Marks
7(c)	**Clark is concerned that some participants may also lie about their dreams because the events in them are too personal to report to Clark.** **Explain which ethical guideline Clark is concerned about.** 1 mark for identification of privacy / psychological harm 1 mark for explanation (Does **not** have to be linked) (the guideline of) privacy; (identification) participants have the right to keep their information to themselves; (unlinked expl) participants may want to keep their dreams a secret have the right to keep their dream content to themselves; (linked expl) because participants may be embarrassed/distressed; (expl) (the guideline of protection from) psychological harm; (identification) because participants may be embarrassed/distressed; (expl)	**2**
7(d)	**Clark thinks that participants' eye movements during dream sleep are related to the content of their dreams.** **Suggest how Clark could use participants' eye movements during dream sleep to investigate whether they are lying about their dream content.** 1 mark for basic suggestion 1 mark for detail relating to lying He could use the EEG/EOG to see how the participant's eyes move; (suggestion) He could directly observe participants' eyes move; (suggestion) This could tell him if they are moving in a way that fits the reported dream or not; (detail) e.g. if they said they dreamed of jumping over buildings the eye movements would be up-down; (detail) eye movements in dreams should match content; so if they don't match they are lying; = 2	**2**

Question	Answer	Marks
8	**Liang is planning to observe behaviour in a park. He is going to sit on a bench and pretend to be using his phone. His aim is to investigate factors which could cause one person to say hello to another person. Two possible factors are age and gender.**	
8(a)	**Explain whether Liang is conducting a participant observation or a non-participant observation.** 1 mark for **explanation** (No mark for identification of observational technique) Non-participant **because** he is not passing by anyone; Non-participant **because** he will not need to acknowledge anyone as he is on his phone;	**1**
8(b)	**Liang expects that if a person has an animal with them, other people will be more likely to say hello.** **Explain <u>one</u> other factor for Liang to observe that could affect whether a person says hello.** **Do <u>not</u> refer to age or gender in your answer.** 1 mark for factor (identification) MUST be an **observable** factor 1 mark for explanation Whether they smile (or not); (id) Because smiling is friendly (so more likely); (explanation) If they are singing; (id) That may be strange (so less likely); (explanation) If they are in smart or scruffy clothes; (id) If they are grumpy (not observable) = 0	**2**
8(c)	**Liang collects data about the number of males and females who say hello when another person has an animal with them. He plots his data on the graph in Fig. 1.** **Suggest <u>two</u> conclusions that Liang can draw from his data in Fig. 1.** 1 mark for a conclusion ×2 (definitive) Females are more likely to say hello **than males**; People are more likely to say hello when an animal is present (than when they are not); The presence of an animal makes more of a difference if you are female than if you are male;	**2**

Question	Answer	Marks
8(d)	**Participants could realise that Liang is conducting an observation.** **Suggest <u>two</u> problems this could cause.** 1 mark for suggested problem } ×**2** 1 mark for detail } They may feel upset because they are being watched / feel they have been deceived; (ethical problem) so breaks (the ethical guideline of) protection from harm / informed consent; (detail) They may change their behaviour / show social desirability / respond to demand characteristics; (practical problem) So they may be more/less likely to say hello (than if they didn't realise); (detail) An (ethical) problem is right to withdraw; (ethical problem) they cannot exercise this because **once they know they are being watched it's too late**; (detail)	**4**

Question	Answer	Marks
9	**Tara can measure physical reaction time using a machine that records the time between a light flashing and the participant pressing a button. Tara will use this measurement to investigate whether there is a relationship between participants' physical reaction time and how quickly they can recall numbers.**	
9(a)	**Explain the research method that Tara is using.** 1 mark for identifying **correlation** (DEFINITIVE) 1 mark for linked explanation Correlation; (identification of research method) Because she is looking for 'a relationship between how quickly they can recall numbers and their physical reaction time'; (explanation) She is looking for a link between two continuous measured variables; (ID of research method without naming) reaction time and recall speed; (explanation)	**2**
9(b)	**Suggest a procedure Tara could use to measure how quickly participants can recall numbers.** 1 mark per correct detail of procedure. For full marks the procedure must produce data that can be correlated (i.e. on a scale) Present/read/show (a list) of numbers; Start time and tell the participant to recall all the numbers; Stop the timer when they have recalled them all;	**3**

Question	Answer	Marks
9(c)	**Suggest <u>one</u> practical problem with the procedure you have suggested in (b).** 1 mark for suggested problem 1 mark for detail (does not have to be linked) The participants might not recall all of the numbers; (problem) So Tara wouldn't know when to stop timing; (detail) The participants might not have recalled the numbers accurately; (problem) So Tara's timing couldn't be used / would not be valid / would be an underestimate; (detail) The researcher's reaction time; (problem) They might be too slow to start/stop recording the participant; (detail)	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>10</td><td>Justin wants to investigate whether adults are happier when they play particular sports. Many different sports could affect happiness in different ways.</td><td></td></tr>
<tr><td>10(a)</td><td>Describe how Justin could conduct a study using a questionnaire to investigate how different sports affect adults' happiness.

Three majors for a questionnaire are:
a content of questions asked (detail: sports, emotions, reasons)
b style of questions asked likert/rating (detail: open / closed)
c 'who' e.g. adults (implied) e.g. males and females/distribution of questionnaire to participants (detail: source, sampling, ages)

The minors are:
where: location of participants when completing the questionnaire / how it is distributed
when:
Other details for replication:
• lie questions
• filler questions
• sampling technique
• sample size
• description of how closed questions will be scored
• description of how open questions will be interpreted
• ethical issues

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 (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.</td><td>10</td></tr>
</table>

<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
• 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.
<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>