



Cambridge International AS & A Level

PSYCHOLOGY

9990/21

Paper 2 Research Methods

October/November 2020

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.

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This document consists of **14** printed pages.

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.

Question	Answer	Marks
1	In the study by Yamamoto et al. (chimpanzee helping), one variable being measured was the object offered by a chimpanzee.	
1(a)	Describe <u>two</u> ways in which an ‘object offer’ was operationalised in this study. 1 mark for feature of object offer x2 Helper held out an object (tool) to the recipient = 1 Only the first object offered counted = 1 Correct or incorrect tool offer / tool or non-tool / stick, straw or hose, chain, rope, brush, belt = 1 ‘Correct tool’ / stick or straw <i>only</i> = 0 ‘Incorrect tool’ / hose, chain, rope, brush, belt <i>only</i> = 0	2
1(b)	Explain whether this study was ecologically valid. 1 mark for reason for ecologically valid or not (no mark for just ‘yes’ or ‘no’); 1 mark for detail or for second reason (if two reasons, can be one ‘yes’ and one ‘no’); For 2 marks the answer must have a link; Yes, because chimpanzees are social animals so do communicate = 1 reason (+ link) So they would communicate about food to help each other = 1 detail Yes because chimpanzees are intelligent animals who use tools = 1 reason (+ link) So they could use each other's tools in the wild = 1 detail (also + link) No because chimpanzees wouldn't normally use tools (i.e. straws/hose/chain/rope/brush/belt) = 1 reason (+ link) They would use stones/natural objects = 1 link Yes, because helping is a normal behaviour = 1 reason (no link) No, because the task wouldn't happen in the wild / no because it is in a lab (not in the wild) = 1 reason (no link)	2

Question	Answer	Marks
2	In the study by Saavedra and Silverman (button phobia), data was collected in the form of statements. During therapy the boy stated that: • buttons ‘emitted unpleasant odours’ • ‘buttons are gross’.	
2(a)	Identify this type of data. Include a reason for your answer that refers to the boy’s statements. 1 mark for type of data: qualitative DEFINITIVE 1 mark for reason (linked) Qualitative = 1 type Not numerical = 0 (no link) Word-based data = 0 (‘word based’ is incorrect) Because the statements are descriptive expressions of how he feels = 1 reason Because the statements are descriptive/detailed, e.g. said ‘buttons are gross’ = 1 Word-based data (e.g. said ‘buttons are gross’) = 0 (‘word based’ is incorrect) Qualitative (1) because the statements are descriptive/detailed = 0 (no link) Qualitative (1) because he said ‘buttons are gross’ = 0 (no reason)	2
2(b)	Explain <u>one</u> disadvantage of collecting this type of data in this study. 1 mark for disadvantage 1 mark for link Lacks reliability / it may be difficult to interpret / researcher may be subjective/biased = 1 disadvantage He may say things like ‘emit unpleasant odors’, which doesn’t make sense for buttons, so is open to misinterpretation = 1 link Cannot use graphs / measures of central tendency / measures of spread / statistics = 1 (generic)	2

Question	Answer	Marks
3	Explain the difference between a ‘measure of central tendency’ and a ‘measure of spread’. 1 mark for definition of measure of central tendency 1 mark for definition of measure of spread Difference is implicit A measure of central tendency gives the ‘middle’/average of the data = 1 Measures of central tendency show a typical score in the set = 1 A measure of spread shows the dispersion/variation (of scores) in a set = 1 Measures of spread look at how big the differences are between scores = 1 Measures of central tendency are the mean, median and mode = 0 (examples not explanation) Measures of spread are the range and the standard deviation = 0 (examples not explanation)	2

Question	Answer	Marks
4	The study by Laney et al. (false memory) used an independent measures design. However, there was still a risk of order effects.	
4(a)	Explain what is meant by ‘order effects’, using this study as an example. 1 mark for defining order effects 1 mark for defining practice effects or fatigue effects (or 2 marks for defining both) 1 mark for related example (link) (max 2 without a link) Must have a link for 3 marks An order effect is the consequence on later performance of earlier performance on the same task = 1 definition of order effects Order effects are where repeated exposure to the experimental situation/ test/condition affects performance = 1 definition of order effects Practice effects are where this leads to improvement = 1 definition of practice effects e.g. through familiarity with the food questionnaires = 1 link e.g. from remembering previous answers to food questionnaires (FHI/RQ) = 1 link Fatigue effects are where performance worsens = 1 definition of fatigue effects e.g. through boredom because the food questionnaires (FHI/RQ) were done twice = 1 link	3
4(b)	Explain why order effects reduce validity in experiments. 1 mark for explanation Because differences between conditions may be due to order not due to the different levels of the independent variable = 1	1

Question	Answer	Marks
5	Explain why following ethical guidelines can cause demand characteristics. 1 mark for brief explanation, 2 marks for fully correct explanation OR 1 mark for accurate definition of demand characteristics + 1 mark for why these are worsened by a brief/informed consent Following the guideline of informed consent makes demand characteristics more likely = 1 Demand characteristics are the features of the experimental situation (characteristics) that tell the participants what the requirements of the experiment are (demands) and they are more likely if the study is ethical, so the participants have not been deceived / if the participants have given fully informed consent = 2	2

Question	Answer	Marks
6	Describe the difference between ‘samples’ and ‘populations’ in research, using any examples. 1 mark for basic definition of each term (2 marks in total) 5 further marks for detail/examples. Max 4 marks if only about ‘samples’ OR ‘populations’. No explicit difference is required for full marks. - Population = all the people who could be used in the study / an entire group of people who share something in common / the people whom the results of the study will be used to represent; - Sample = the participants/people who are used in the study / a selection of the population (i.e. it is smaller than the population) (from whom the results will be generalised and should represent the population); different because sample may be biased / unrepresentative of population; different because a population contains many variations, whereas a sample may include just some of those; e.g. Canli right-handed / women; A population is all the people of one type, a sample is just those who become participants = 2 marks e.g. <i>Milgram: population</i> - American / male / New Haven residents / newspaper readers / aged 20-50 years / a range of occupations; <i>Milgram: sample</i> 40 (men) / Who responded to an advert; e.g. <i>Yamamoto: population</i> - Chimps; <i>Yamamoto: sample</i> 5 (chimps) / captive (chimps) / (chimps) at Kyoto (primate research station); e.g. <i>Pepperberg: population</i> (African grey) parrots; <i>Pepperberg: sample</i> - Alex / one / captive; E.g. <i>Andrade: sample</i> 40 / members of MRC/Applied Psychology, Cognition and Brain Sciences panel / from general population / aged 18-55;	6

Question	Answer	Marks
7(a)	Aileen is planning an interview-based study to investigate what old people often forget. She is concerned that this could break the ethical guideline of 'privacy'.	
7(a)(i)	Explain what is meant by the ethical guideline of privacy, using Aileen's study as an example. 1 mark for definition 1 mark for link Privacy relates to not invading a person's thoughts (or space) that they don't want to share = 1 definition Elderly people might not want to talk about things like dead friends / personal things like forgetting their false teeth = 1 link	2
7(a)(ii)	Suggest how Aileen could ensure that she follows the ethical guideline of privacy in her study. 1 mark for solution 1 mark for link or how it solves the problem She could tell them that if there were any things they didn't want to tell her, that was okay (in a brief) = 1 solution So they would have to answer questions about what they have forgotten in the past, which would be embarrassing = 1 link She could make sure that they are aware of their right to withdraw = 1 solution So that they could easily refuse to answer personal questions about what they had forgotten, such as to get dressed = 1 link	2
7(b)	Aileen wants to be certain that the forgetting is due to her participants' age. She could do this by making her study into an experiment, using two groups of participants.	
7(b)(i)	State how Aileen could operationalise her <u>two</u> groups of participants. 1 mark for identifying two groups 1 mark for identifying two groups and operationalising one group 2 marks for operationalising two groups Older people and younger people = 1 identifying e.g. elderly people between 61 and 80 and between 81 and 100 = 1 operationalising	2

Question	Answer	Marks
7(b)(ii)	Aileen believes that a possible extraneous variable is whether any participant has a job. Explain the effect that this extraneous variable could have on the results. 1 mark for statement of effect of job on memory 1 mark for linking to difference between young and old people Having a job could affect how much people use their memories / could make memory better / could make it worse = 1 explanation So the amount you use your memory, rather than age, could be the important factor in forgetting = 1 detail If younger people are more likely to have a work diary than older people they could have more reminders = 1 explanation So the frequency of cues to memory, rather than age, could be the important factor in forgetting = 1 detail	2

Question	Answer	Marks
8	Elaf used a natural experiment to investigate the effect of noise on sleep. His participants completed identical questionnaires before the opening of a new motorway behind their houses and after the motorway had been open for one month.	
8(a)	Explain what is meant by a ‘natural experiment’, using this study as an example. 1 mark for explanation 1 mark for link The IV cannot be manipulated = 1 (explanation) Elaf could not control when the motorway opened = 1 (link) The noise was due to the motorway or not = 1 (link) So the two conditions of the experiment could not be controlled they had to be chosen = 1 (explanation)	2

Question	Answer	Marks
8(b)	Suggest <u>one</u> problem with natural experiments, using this study as an example. 1 mark for problem 1 mark for link Participants (probably) cannot be allocated to different levels of the independent variable = 1 problem There may be important individual differences, e.g. the worst sleepers went away on holiday when the motorway opened = 1 link There are fewer controls than in a laboratory experiment = 1 problem e.g. if people were more angry after the opening of the motorway and this made them sleep badly = 1 link	2
8(c)(i)	Identify the experimental design used in Elaf's experiment. Include a reason for your answer. 1 mark for identifying the experimental design Repeated measures DEFINITIVE 1 mark for reason Answer must be linked for both marks Repeated measures is where the same participants are used in each level of the independent variable = 1 identify (All of) Elaf's participants do both the before/quiet/first test phase and the after/noisy/second test phase = 1 (linked) reason	2
8(c)(ii)	Explain <u>one</u> advantage of using this experimental design in Elaf's experiment 1 mark advantage 1 mark link (more valid as) Individual differences between participants aren't so important as each participant is his/her own baseline = 1 advantage People sleep differently, e.g. badly or well generally, and this could distort the results if they were all in one group = 1 link People are more or less sensitive to noise – 1 link	2

Question	Answer	Marks
9	Jasmin conducted an overt observation of friendship behaviours on customers in a café for many weeks. She observed the same customers every day, who initially asked her what she was doing. She explained that she was taking notes on their behaviour.	
9(a)	Explain what made Jasmin's study an overt observation. 1 mark for explaining 'overt observer' (does not have to be linked, but can be) The role of an overt observer is obvious to the participants = 1 (generic) Jasmin is sitting openly watching and taking notes / she tells people what she is doing if they ask / she tells people that she is taking notes on their behaviour = 1 (linked)	1
9(b)	Suggest <u>one</u> advantage of overt observations, using Jasmin's study as an example. 1 mark advantage 1 mark link She can get to know the individuals so they are used to her / she will become familiar = 1 advantage So the customers she is observing will not change their behaviour because they know she is watching them = 1 link It reduces risk on invading privacy / people do not have to participate / they the right to withdraw = 1 advantage e.g. because customers can choose to leave if they don't want to be observed = 1 link	2
9(c)	Suggest <u>one</u> disadvantage of overt observations, using Jasmin's study as an example. 1 mark disadvantage 1 mark link e.g. If the customers are getting on badly, they might choose to sit somewhere else (so they are not watched) = 1 link This means her sample of behaviour would be biased as she would see more getting on well than badly = 1 disadvantage Risk of social desirability / demand characteristics = 1 (disadvantage) e.g. participants might show more/less friendly behaviours (because they know they are being watched) = 1 (link)	2

Question	Answer	Marks
9(d)(i)	Suggest <u>two</u> behavioural categories that Jasmin could have used to record ‘friendship behaviours’. 1 behavioural category = 1 mark × 2 Listening (attentively) = 1 Laughing (together) = 1 Smiling (at each other) = 1 Mirroring (behaviour) = 1 Physical contact (shaking hands, high fives, hugging) = 1	2
9(d)(ii)	For <u>one</u> of the behavioural categories you suggested in (d)(i): Explain <u>one</u> disadvantage of using this behavioural category. A disadvantage of a category of friendship behaviour from 9(d)(i) = 1 Listening attentively might be hard to judge because they could just look attentive but really be daydreaming = 1	1

Question	Answer	Marks
10	Valerie is a teacher. She notices that students who are expecting a test in another lesson are more likely to feel angry in her lesson. She thinks this is because they are misinterpreting their high level of arousal as anger rather than anxiety about the test. She decides to use a questionnaire to investigate whether her students are misinterpreting their arousal.	
10(a)	Describe how Valerie could conduct a study using a questionnaire to investigate whether students who are expecting a test in another lesson are misinterpreting their arousal. Three majors for this study using a questionnaire are: Who/when: – sample of classes expecting a test (and not expecting a test) How: – style of questions asked (e.g. open or qualitative and interpretation / closed or quantitative and how scored) What: – content of questions asked (i.e. to include anxiety and anger for Level 3, therefore about misinterpretation) The minors are: where: location of participants when completing the questionnaire / how it is distributed Also: lie questions filler questions sampling technique sample size 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 (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.	10

Question	Answer	Marks										
10(b)	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. 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. <table><tr><th>Mark</th><th>Description</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; <i>plus</i> 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>	Mark	Description	3–4	Appropriate problem identified; Appropriate solution is clearly described;	2	Appropriate problem identified; <i>plus</i> EITHER Explanation of why it is a problem OR Ineffectual but possible solution described;	1	Appropriate problem identified; Little or no justification;	0	No response worthy of credit.	4
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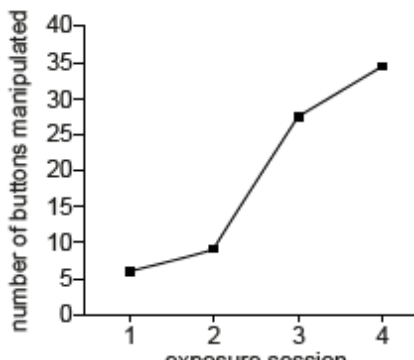
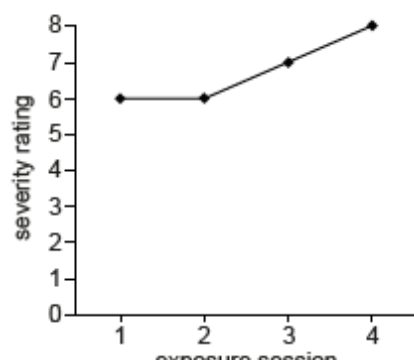
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Question	Answer	Marks
1	In the study by Saavedra and Silverman (button phobia), the results were the effect of the therapy sessions on button manipulation and on severity rating of distress. These are shown in Fig. 1.1 and Fig. 1.2.  Fig. 1.1  Fig. 1.2 Explain <u>one</u> conclusion from the results on each graph. You <u>must</u> refer to the results in each conclusion. 1 mark for 1 conclusion × 2 Linked to evidence from the graph × 2 The therapy worked / he was able to manipulate buttons better after therapy = 1 (conclusion), because in later exposure sessions the number of buttons he manipulated increased from 28 to 35 (graph) = 1 (graph) Therapy increases distress / the therapy didn't work as he became more stressed over time = 1 (conclusion), because the severity rating he gave the buttons rose from 6 to 8 (graph) = 1	4

Question	Answer	Marks
2	From the study by Laney et al. (false memory):	
2(a)	State why a false memory about liking asparagus would be more ethical than a false memory created using filmed events like car crashes and thefts. 1 mark for reason Car crashes could be distressing/upsetting/frightening so break the ethical guideline of not causing physical/mental harm = 1	1

Question	Answer	Marks
2(b)	Explain <u>one</u> way in which the study by Laney et al. was <u>not</u> ethical. 1 mark for reason, e.g. guideline broken 1 mark for detail Broke guideline of deception = 1 (guideline) As the participants were led to believe their memory was real / were told it was a study about food preferences and personality (when it was actually about false memory) Can credit answers other than deception which are justified	2

Question	Answer	Marks
3	Libby is planning a case study of a boy with autism to investigate his social interactions.	
3(a)	Explain how Libby could use <u>two</u> different techniques to collect data in her case study. Name/identification of a method of data collection × 2 Linked explanation × 2 Interview = 1 (name/ID) / Ask the boy face-to-face questions; (ID) (questions) such as 'What situations do you think make your symptoms worse?' = 1 (link) Observation = 1 (name/ID) Watch his behaviour at school / alone / at home etc., to look for factors that may relate to changes in his behaviour = 1 (link) Questionnaire = 1 (name/ID) Ask closed questions such as 'Do you smile back when someone smiles at you?' yes/no' = 1 (link) Tests/tasks = 1 (name/ID) use the Eyes test to see if he can recognise emotions from faces = 1 (link)	4

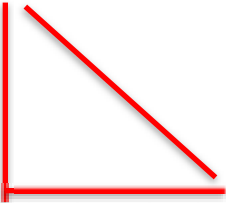
Question	Answer	Marks
3(b)	For <u>one</u> of the techniques you explained in 3(a): Suggest <u>one</u> problem with using this technique in this study. Do <u>not</u> refer to generalisability in your answer. 1 mark for problem 1 mark for link <i>Interview:</i> researcher gets to know the individual = 1 (problem) So Libby may be biased in her interpretation of his social interactions, e.g. he = 1 (link) <i>Observation:</i> Unless Libby is covert and non-participant, she will affect the participant's behaviour by her presence = 1 (problem) So Libby would change the way the boy behaved by being there = 1 (link) <i>Questionnaire:</i> closed questions limit the answers that can be given = 1 (problem) So the boy may not have been able to find that option that described him = 1 (link)	2

Question	Answer	Marks
4	In the study by Canli et al. (brain scans and emotions), the dependent variable of emotional arousal was measured by the participants pressing buttons 0, 1, 2 or 3. Suggest why it was necessary for the participants to press buttons rather than speaking or writing. 1 mark for reason Because they were in a scanner so couldn't move much / couldn't move to speak / write = 1	1

Question	Answer	Marks
5	In a study about phobias, researchers have identified two problems.	
5(a)	One problem is that they cannot be sure that they are studying phobias rather than just dislikes. For example, people may refuse to eat a food they claimed to have a phobia of simply because they don't like it Explain whether this is a problem of validity or reliability. 1 mark for name of validity <u>and an explanation</u> (does not have to be linked) Validity (identification) as they will not be measuring the variable they expected to measure (generic) = 1 Validity (identification) as they will not be measuring phobias, but dislikes instead (linked) = 1 Reliability (incorrect) as they will not be measuring phobias, but dislikes instead (linked) = 0	1

Question	Answer	Marks
5(b)	Another problem is that they cannot be sure that they are measuring phobias consistently. For example, the researchers may interpret the participants' written comments differently. Explain whether this is a problem of validity or reliability. 1 mark for name of reliability <u>and</u> an <u>explanation</u> (does not have to be linked) Reliability (identification) because it is about the researchers' consistency in recording data (explanation) (generic) = 1 Reliability (identification) because they may make different records from the same data (explanation) (linked) = 1 Validity (incorrect) because it is about the researchers' consistency in recording data (explanation) = 0	1

Question	Answer	Marks
6	Describe different types of hypotheses in research, using any examples. 1 mark for <u>basic definition</u> of each type of hypothesis (up to max 4) Max 5 further marks for detail/examples. Hypotheses are testable statement; They are based on a research question / aim; The alternative hypothesis is the one being tested in a study; The alternative hypothesis predicts a difference in an experiment; The alternative hypothesis predicts a relationship in a correlation; A two-tailed/non- directional hypothesis predicts just a difference / relationship; A one-tailed/directional hypothesis in an experiment predicts which level of the IV will be 'better'; A one-tailed/directional hypothesis in a correlation predicts whether the correlation will be positive or negative; The null hypothesis is the one that is used in statistical testing; The null hypothesis predicts that there will be no difference/correlation OR that any difference/correlation is due to chance; e.g. Dement and Kleitman predicted a directional hypothesis that more dreams would occur in REM sleep than nREM sleep; e.g. a suitable null hypothesis would have been 'There is no difference in the amount of dream recall from REM and nREM sleep'; e.g. Baron-Cohen predicted a directional hypothesis of a negative correlation between AQ and eyes test; e.g. a suitable null hypothesis would have been 'Any correlation between AQ and eyes test result is due to chance'.	6

Question	Answer	Marks
7	Claus is investigating whether there is a correlation between happiness and exercise	
7(a)(i)	Outline what the results would show if Claus found a negative correlation. 1 mark for explanation That as exercise increased, happiness would decrease (ORA) = 1	1
7(a)(ii)	Sketch a graph, using the axes below, to show what the pattern of results would look like if Claus found a negative correlation. You <u>must</u> label the axes. Award 1 mark for each of: • scatter graph; • negative slope (essential for 3 marks); • axis heading: 'happiness (score)' OWTTE; • axis heading: '(amount of) exercise' OWTTE. 	3
7(b)	Explain why Claus cannot conclude that exercise causes unhappiness. 1 mark for reason 1 mark for link Because he can't draw a causal conclusion from a correlation = 1 reason Because being happy could make people more willing to exercise = 1 link OR Both variables might change in accordance with another variable (such as geographical location) = 1 link	2
7(c)	Explain why it was useful for Claus to conduct a correlational study before using another method to investigate factors affecting happiness. 1 mark for reason 1 mark for link Because a correlation can find patterns that can then be explored experimentally = 1 reason Happiness or exercise could be used as an independent variable to see if it causes a change in the other variable = 1 link	2

Question	Answer	Marks
8	Duncan is conducting an experiment to test whether watching videos of natural scenes or city scenes is better at helping stressed people to relax. Half of the participants watch the natural scenes first and the city scenes one week later. The other half of the participants watch the city scenes first and the natural scenes one week later.	
8(a)	Identify Duncan's experimental design. Include a reason for your answer. 1 mark for identification and explanation of the design: (generic) 1 mark for link Repeated measures (DEFINITIVE) design because the same participants are used in both levels of the IV (although people can do different orders) = 1 explanation All participants did both the natural and city scenes task = 1 link	2
8(b)	Explain why it is an advantage that the participants watch the scenes in different orders. 1 mark for advantage 1 mark for detail – linked Counteracts order effects / avoids practice/ avoids fatigue = 1 (advantage) e.g. if they found it boring the second time they might be less relaxed anyway = 1 (link) Reduces demand characteristics = 1 (advantage) e.g. if they worked out the aim about type of scene from the first ones, they would respond abnormally the second time = 1 (link)	2
8(c)	Duncan obtains his sample from the student population at his university, who all live in the local city. Suggest <u>one</u> disadvantage of taking the sample from this location in this study. 1 mark for disadvantage 1 mark for link All students = 1 (disadvantage) All city dwellers = 1 (disadvantage) All the same university = 1 (disadvantage) They might tend to find urban scenes even more irritating and be abnormally aroused = 1 (link) (they all live in the city) so they are used to city living / urban scenes = (link)	2

Question	Answer	Marks
8(d)	In order to ensure that his participants are stressed before watching the videos, Duncan could scare them but this would be unethical. He must stress them in an ethical way. He decides to do this by raising their arousal level. Describe <u>one</u> ethical way that Duncan could stress his participants by raising their arousal level. 1 mark suggestion of ethical activity to arouse 1 mark why it is ethically suitable Let them watch an exciting film (of their choice); This is arousing because of the excitement, which is not harmful and films are what people would watch anyway; Let them choose an exciting game to play; This is arousing because of the excitement, which is not harmful as it is a game they have chosen to play.	2

Question	Answer	Marks
9	Lydia is planning to interview students about how they learn a new language.	
9(a)	Suggest <u>one</u> open question that Lydia could ask during her interviews. 1 mark for an open question ‘Explain a difficulty you have had learn your most recent language.’ = 1 ‘Describe what you do to learn a new language.’ = 1 ‘What do you do to learn a new language?’ = 0	1
9(b)	Suggest <u>one</u> disadvantage of using open questions in this study. 1 mark for disadvantage 1 mark link Open questions are hard to analyse because they are non-numerical = 1 (disadvantage) To it would be hard to compare learners of different languages = (link)	2

Question	Answer	Marks
9(c)	Lydia's first language is English. Her participants speak a variety of different first languages, although all can understand English. Explain why the variety of first languages spoken by the participants could still be a problem in Lydia's study. 1 mark for problem 1 mark for detail Because the interviews would have to be in English for these people = 1 (problem) Whereas other participants could have been in their first language, so easier to understand = 1 (detail) Because the features of learning a language might differ depending on the language itself = 1 (problem) Lydia might not understand exactly what the participants mean = 1 (detail)	2
9(d)	Suggest what type of interview Lydia should conduct in this study. Include a reason for your answer. 1 mark for naming / identifying an appropriate type of interview 1 mark for justification 1 mark for link A structured interview = 1 (name) So that each participant is asked the same questions, which makes the results easy to compare/analyse = 1 (reason) e.g. so all the participants are asked questions about learning verb patterns = 1 (link) An unstructured interview = 1 (name) So that each participant can be asked individual/follow-on questions, which makes the results more valid = 1 (reason) e.g. so participants can be asked individual questions about what they find hard when remembering nouns = 1 (link) A semi-structured interview = 1 (name) So a participant can be asked both set questions to compare and follow-on questions that are specific to them = 1 (reason) e.g. so it is possible to ask standardised questions and ones about the individuals' language learning habits = 1 (link)	3

Question	Answer	Marks				
10	Anisha and Megane are supervisors who walk around the school during lunchtime to watch the children in the building, playground and lunch hall. They have been asked by Sue, who is head of the psychology department, to be observers in a study on helpful behaviour in the school.					
10(a)	Describe how Sue could conduct a participant observation of helping behaviour in school, using Anisha and Megane to assist her. Three majors for an observational study are: What: behaviours that will be recorded, e.g. one named (detail, e.g. definition/operationalisation of behavioural categories) How: any two of: • naturalistic/controlled; • structured/unstructured; • covert/overt; • participant/non-participant; (detail is how they are achieved OR more than two) The minors are: where – location of participants when data is collected (<i>must be school</i>) who – participants (<i>must be students and or staff</i>) • sampling technique; • sample size; • description of how tallying will be done; • description of how data will analysed, e.g. use of averages/bar charts; • ethical issues; Other appropriate responses should also be credited. Mark according to the levels of response criteria below: <table><tr><td>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; </td></tr><tr><td>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; </td></tr><tr><td>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; </td></tr><tr><td>Level 0 (0 marks) • No response worthy of credit. </td></tr></table>	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.	10
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Question	Answer	Marks										
10(b)	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. 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. <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. <i>plus</i> 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>	Marks	Comment	3-4	Appropriate problem identified. Appropriate solution is clearly described.	2	Appropriate problem identified. <i>plus</i> EITHER Explanation of why it is a problem OR Ineffectual but possible solution described.	1	Appropriate problem identified. Little or no justification.	0	No response worthy of credit.	4
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Cambridge International AS & A Level

PSYCHOLOGY

9990/23

Paper 2 Research Methods

October/November 2020

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.

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Cambridge International is publishing the mark schemes for the October/November 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

This document consists of **16** printed pages.

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.

Question	Answer	Marks
1	From the study by Bandura et al. (aggression):	
1(a)	Identify <u>one</u> example of quantitative data collected in this study. 1 mark for example (can be example of category or example of data) The number of times a child hit a doll with a mallet = 1 mark Number/percentage of boys and girls showing physical aggression = 1 mark The mean number of girls with a female model producing imitative verbal aggression = 1 mark There are many possible correct responses, these are only examples.	1
1(b)	Explain <u>one</u> advantage of collecting quantitative data in this study. 1 mark for advantage 1 mark for link It can be analysed mathematically/statistically = 1 advantage So they could calculate the mean number of acts of different types of aggression the children did = 1 link It is objective = 1 advantage They would be less prejudiced in recording, e.g. if they expected boys to be more aggressive than girls = 1 link	2

Question	Answer	Marks
2	In the study by Andrade (doodling), the participants were people from the general public who were members of an Applied Psychology Unit participant panel. Explain <u>one</u> advantage and <u>one</u> disadvantage of using participants from a participant panel in this study. 1 mark for advantage 1 mark for link They would be more varied than opportunity samples (e.g. of commonly used students) = 1 advantage They would do a range of interesting and boring jobs so might vary in doodling habits = 1 link Volunteers so less likely to withdraw = 1 advantage Less likely to give up because deliberately boring task = 1 link Easy to get a big sample size = 1 advantage Useful if doodling/attention/memory varies a lot in the population = 1 link 1 mark for disadvantage 1 mark for link They were volunteers on a research panel so would tend to be highly motivated people = 1 disadvantage So they would try even when the source is hard so would have made more effort than normal to remember the names = 1 link Knew they would be / interested in participating in a psychological study = 1 disadvantage So doodlers more likely to be affected (= confounding variable) / demand characteristics so focus on message/names = 1 link The volunteers may all be similar, e.g. mainly female = 1 disadvantage And some people may doodle more / pay attention better / have worse recall = 1 link	4

Question	Answer	Marks
3	Carrie is studying when people decide to eat meals and the quality of their sleep. She is worried about variables that could affect when people decide to eat meals, and the effect these could have on validity.	
3(a)(i)	Suggest <u>one</u> participant variable that could affect when people decide to eat meals. 1 mark for variable When someone normally eats = 1 Culture/ethnicity/lifestyle = 1 How busy they are = 1 How much someone normally eats at meals = 1 Their age / young/old eat earlier = 1 If they are dieting / have special dietary needs = 1 Drugs affect hunger: tea/coffee/alcohol = 1 Hunger/thirst = 1	1
3(a)(ii)	Explain how this participant variable could affect the validity of Carrie's study. 1 mark for explanation of effect on validity: must link effect of variable (e.g. food/hunger/thirst) and sleep If demand characteristics change meal times, they may be hungry when they sleep = 1 If they eat a lot / often / don't get hungry when they eat may not affect their sleep = 1	1
3(b)(i)	Suggest <u>one</u> situational variable that could affect when people decide to eat meals. 1 mark for variable Whether there are nice food smells when they are eating = 1 variable If they have a job that stops them eating at normal meal times = 1 variable	1
3(b)(ii)	Explain how this situational variable could affect the validity of Carrie's study. 1 mark for explanation of effect on validity Whether there are nice food smells: this might make them eat earlier/more which could affect their sleep = 1 If they have a job that stops them eating at normal meal times: would make them eat less regularly affecting their sleep = 1	1

Question	Answer	Marks
4	Dement and Kleitman studied participants who were asleep. Explain <u>one</u> limitation in research with participants who are asleep that does not apply to participants who are awake. You must refer to the study by Dement and Kleitman in your answer. 1 mark for limitation 1 mark for link You cannot talk to them = 1 limitation So Dement and Kleitman had to wake them up, then they were not asleep anymore = 1 link Participants forget their dreams while they are sleeping = 1 limitation So Dement and Kleitman could probably only find out about recent dreams from the participant = 1 link Sleeping participants are still sleepy when they wake up = 1 limitation So Dement and Kleitman would only have found out partial data about the dreams = 1 link Participants who are awake can estimate time durations accurately but sleeping participants may not be able to = 1 limitation So Dement and Kleitman had to limit estimation to a guess of 5 or 15 minutes when they were asleep = 1 link	2

Question	Answer	Marks
5(a)	Explain what is meant by the ethical guideline of ‘reward’ in relation to animals in psychological research. 1 for explanation Motives for animals should be pleasant (reinforcement) rather than unpleasant (punishment/deprivation) = 1	1
5(b)	Describe how the ethical guideline of ‘species and strain’ affects what psychologists should, or should not, do with animals. 2 marks for what psychologist should and or should not do (this will encompass any definition of the guideline) They should use a species/strain that will be less distressed; Use a species that will feel less pain; But use one that will serve the purpose of the experiment, so this is a compromise;	2

Question	Answer	Marks
6	Describe the similarities and differences between a structured and an unstructured interview, using any examples. 1 mark for each example that is linked to one type of interview (maximum of 2 marks in total). Examples can include examples from studies using such questionnaire/interviews, or of ways they could be used. Max 4 if only structured / only unstructured interviews. Max 5 if only similarities / only differences. Similarities: • interviews are a form of self-report / a way to ask the participant questions; • interviews are face-to-face / telephone / real time; Differences: • structured interviews follow set questions; • they may also have set dress/tone to standardise the interviewer; • e.g. Dement and Kleitman asked participants to describe their dream (a single structured question); • unstructured interviews are more flexible / the interviewer can add questions in response to the participant's responses; • unstructured interviews (tend to) use more open questions / ask for descriptions/detail / (tend to) produce qualitative data; • e.g. Schachter and Singer interviewed participants and asked 'How are you feeling?'; • e.g. Dement and Kleitman sometimes went in to the participants to ask them more questions about each dream;	6

Question	Answer	Marks
7	A company is having a new kitchen built that will produce better quality food for its workers so will improve work output. Cedric measures work output three weeks before the new kitchen opens, as a baseline. He finds work output is low. When Cedric measures work output again three weeks after the new kitchen opens, he finds that work output is higher.	
7(a)	State how Cedric could operationalise the independent variable in his study. 1 mark for identifying the independent variable 1 mark for operationalisation Kitchen = 1 independent variable Poor quality and good quality food = 1 operationalisation Also accept: food quality = 1 independent variable Old kitchen and new kitchen = 1 operationalisation	2
7(b)	State how Cedric could operationalise the dependent variable in his study. 1 mark for identifying the dependent variable + 1 mark for operationalisation OR 1 mark for operationalisation + 1 mark for detail Work output = 1 dependent variable e.g. Number of emails sent per day = 1 operationalisation	2
7(c)(i)	Suggest <u>one</u> extraneous variable that could affect Cedric's results. 1 mark for identifying a variable that needs to be controlled The work pressure at that time = 1 Alternative sources of food = 1	1
7(c)(ii)	Explain why it is necessary to control this variable in this study. 1 mark for explaining why The work pressure at that time: if they are much busier, they may be more productive anyway = 1 Alternative sources of food: if they can go out for food, lunch quality won't affect work output between conditions = 1	1

Question	Answer	Marks
7(c)(iii)	Suggest <u>one</u> way that Cedric could control this variable. 1 mark for suggestion 1 mark for detail/justification The work pressure at that time: conduct the study at a time when the work load is steady = 1 suggestion So there is no other reason to change output = 1 justification Alternative sources of food: ensure that workers eat only canteen food during test weeks, e.g. make it free = 1 detail	2
7(d)	Cedric's study was a natural experiment. Give <u>one</u> reason why Cedric had to choose this method for his study. 1 mark for identification of reason 1 mark for explanation, e.g. link to practical/ethical reason Because the IV was naturally occurring = 1 (reason) So Cedric could not control the variable of food quality in the company = 1 (practical reason) Because it would be unethical to make workers have a poor quality lunch deliberately = 1 (ethical reason) Because it would have violated the guideline of harm (by reducing the quality of the food unnecessarily) = 1 (ethical reason)	1

Question	Answer	Marks
8	Jeni implanted false memories about feeling ill in two different contexts: • relating to food • relating to location. Her laboratory experiment tested participants' confidence that these 'memories' were true. She used a ten-point rating scale to measure this confidence.	
8(a)(i)	Suggest why Jeni used a ten-point rating scale for confidence rather than asking participants if they were confident in the 'memory' or not. 1 mark for brief suggestion + 1 mark for detail 2 brief suggestions = 2 marks Confidence is a 'sliding scale' / range / extent / obtain ordinal or continuous data rather than nominal or discrete data = 1 reason So Jeni can distinguish between who is really confident and who isn't / less reductionist than yes or no = 1 detail Because they may not be very confident about their memory for some occasion when they were sick = 1 reason	2
8(a)(ii)	Suggest <u>one</u> disadvantage of using a ten-point rating scale in this study. 1 mark for disadvantage 1 mark for linked disadvantage Individuals may interpret the scale differently (disadvantage); So a confidence level of 5 may not mean the same for everyone (link) ; It doesn't allow them to explain (disadvantage); It is a closed question / quantitative (disadvantage); Because they may want to say why they don't feel confident (link); Because they can't explain what they feel confident about (link);	2
8(b)(i)	Jeni knew that many factors could affect memory and she wanted to obtain results that could be generalised beyond her sample. Identify <u>one</u> sampling technique that Jeni could have used to obtain a representative sample. 1 mark for correct answer: Random sampling = 1	1

Question	Answer	Marks
8(b)(ii)	Suggest how Jeni could have obtained a sample using the sampling technique you have suggested in (b)(i). 1 mark for basic/partial description of the technique 2 marks for clear/complete definition Random sampling: People in the whole population being targeted are given a number (for random selection of numbers); (e.g. by) pulling names out of a hat/computer generator gives you / so each has an equal chance of being in the sample; Stratified sampling: Taking people from each of predetermined segments of society, e.g. different ages; In proportion to their existence in the population;	2

Question	Answer	Marks
9	Daniel is planning a correlational study. He is investigating the relationship between how happy a person is and how many friends they have.	
9(a)	Suggest how Daniel could operationalise each variable. 2 marks for operationalisation for a variable × 2 Happiness: How likely they think they are to win a new game you play with them = 1 On a score of 0 (not at all) to 5 (very) = 1 Their score on a questionnaire asking about their mood = 1 With questions like 'Do you think this year is going well?' = 1 Number of friends: Ask them to count their friends = 1 Ask the how many contacts they have on their phone = 1 Then take off all the tradespeople, work colleagues etc. = 1 Tell them to only include (close) friends not (loose) acquaintances = 1	4
9(b)	Explain why Daniel should be concerned about the subjectivity of his data about happiness. 1 mark for explanation 1 mark for detail Happiness is subjective = 0 marks (repetition of question) Happiness is not objective = 0 marks (essentially repetition of question) A qualitative measure may subjectively scored by the researcher = 1 mark (explanation); because comments about happiness may need to be interpreted = 1 mark (detail) e.g. not everyone sees 'happiness' in the same way = 1 mark (explanation) because some people might think happiness is being calm, others might think it is being excited = 1 mark (detail)	2

Question	Answer	Marks
9(c)	Explain why Daniel should be concerned about <u>one</u> extraneous variable that could affect his data about friendships. 1 mark for identifying potential extraneous variable, i.e. a third factor that affects friendships 1 mark for explanation How many close family they have: because someone with more family may need fewer friends to be happy; Religion: meeting people through religious services may mean that people have more acquaintances / need less support so have fewer friends; Whether they live in a built-up area: people in rural areas have less chance to make friends as there are fewer people; Age: older people's friends may be dead; Gender: women tend to have more friends than men;	2

Question	Answer	Marks				
10	Jayce owns a shop and is concerned that people are disobeying his signs which say ‘Do not touch’ or ‘No food allowed’. Jayce has asked his daughter Kimberley, who is studying psychology, for some help to understand this disobedience.					
10(a)	Describe how Kimberley could conduct a non-participant observation of people in her father’s shop to investigate obedience to his signs. Three majors for this non-participant observational study are: What: – behaviours that will be recorded e.g. one named (detail e.g. definition/ operationalisation of behavioural categories); How: – non-participant observation – details; How: – further details of: – naturalistic/controlled; – structured/unstructured; – covert/overt. The minors are: where – location of participants when data is collected (shop); who – participants (shoppers); Also: • sampling technique; • sample size; • description of how tallying will be done; • description of how data will analysed, e.g. use of averages/bar charts; • ethical issues; Other appropriate responses should also be credited. Mark according to the levels of response criteria below: <table><tr><td>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; </td></tr><tr><td>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; </td></tr><tr><td>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; </td></tr><tr><td>Level 0 (0 marks) No response worthy of credit. </td></tr></table>	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.	10
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Question	Answer	Marks										
10(b)	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. 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. <table><tr><th>Marks</th><th>Comments</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. <i>plus</i> 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>	Marks	Comments	3–4	Appropriate problem identified. Appropriate solution is clearly described.	2	Appropriate problem identified. <i>plus</i> EITHER Explanation of why it is a problem OR Ineffectual but possible solution described.	1	Appropriate problem identified. Little or no justification.	0	No response worthy of credit.	4
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