GCE

Psychology

H567/01: Research methods

A Level

Mark Scheme for June 2025

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

MARKING INSTRUCTIONS

PREPARATION FOR MARKING

RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Online Training: OCR Essential Guide to Marking*.

2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are available in RM Assessor

3. Log-in to RM Assessor and mark the **required number** of practice responses ("scripts") and the **required number** of standardisation responses.

MARKING

1. Mark strictly to the mark scheme.

2. Marks awarded must relate directly to the marking criteria.

3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the RM Assessor messaging system.

5. **Crossed-Out Responses**
   Where a candidate has crossed out a response and provided a clear alternative then the crossed-out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed-out response where legible.

   Rubric Error Responses – Optional Questions
   Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM Assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

Multiple-Choice Question Responses
When a multiple-choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).

When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses
When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only one mark per response)
Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth two or more marks)
If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space).

Longer Answer Questions (requiring a developed response)
Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there, then add the annotation 'SEEN' to confirm that the work has been seen and mark any responses using the annotations in section 11.

7. There is a NR (**No Response**) option. Award NR (No Response):

   - if there is nothing written at all in the answer space
   - OR if there is a comment which does not in any way relate to the question (e.g., 'can't do', 'don't know')
   - OR if there is a mark (e.g., a dash, a question mark) which is not an attempt at the question.

   Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

8. The RM Assessor **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response:
    To determine the level – start at the highest level and work down until you reach the level that matches the answer

    To determine the mark within the level, consider the following

Descriptor	*Award mark*
On the borderline of this level and the one below	At bottom of level
Just enough achievement on balance for this level	Above bottom and either below middle or at middle of level (depending on number of marks available)
Meets the criteria but with some slight inconsistency	Above middle and either below top of level or at middle of level (depending on number of marks available)
Consistently meets the criteria for this level	At top of level

11. Annotations

Annotation	Meaning
	Correct
	Incorrect
	Unclear
CONT	Context
L1	Level 1 (RF is basic)
L2	Level 2 (RF is limited)
L3	Level 3 (RF is reasonable)
L4	Level 4 (RF is good)
EVAL	Evaluation
REP	Repetition
^	Missing information
NAQ	Not answering question
BOD	Benefit of doubt given
IRRL	Irrelevant
SEEN	Seen (to show content on a page has been noted, but not credited)
	Highlighter tool

/	Stopped marking at this point/capped

12. Subject Specific Marking Instructions

Section A: Multiple choice

Question	Answer	Mark	Guidance
1	**D**	1	overt
2	**D**	1	> >
3	**D**	1	Wilcoxon Signed Ranks test
4	**B**	1	scatter diagram **B**
5	**C**	1	method
6	**B**	1	debrief
7	**C**	1	number of participants
8	**A**	1	5
9	**A**	1	Freud (1909) Little Hans
10	**D**	1	Gould (1982) A nation of morons – Bias in IQ testing
11	**B**	1	5.8
12	**B**	1	16
13	**D**	1	the research question
14	**A**	1	Milgram, S. (1963) Behavioral study of obedience *Journal of Abnormal and Social Psychology*, 67, (4), 371–8
15	**C**	1	face
16	**A**	1	alphabetically by researcher's surname
17	**B**	1	it has topics to cover rather than fixed questions
18	**C**	1	it takes place in a natural setting
19a	**D**	1	ratings of aggression by two observers
19b	**D**	1	the toys were placed in the same position for each participant

Section B: Research design and response

Write a null hypothesis for this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
20			For example… *There will be no significant correlation between the number of disfluencies a person makes and how anxious they feel on a rating scale 1-10.*	**Max 3**	Context = disfluencies, uh, erm and ah, public speech, anxiety etc Can be written in future or present tense. Use of the word 'significant' is not necessary for full marks. For full marks both the variables **must** be operationalised (there are many ways to operationalise each variable but each one must be on a continuous quantitative scale to allow for a correlation to be carried out, e.g. disfluencies = **number of** disfluencies, anxiety = **score out of 10**). Zero marks for use of the word 'difference' or referring to cause/effect. Zero marks for an alternative hypothesis or muddled attempt like "there will be no positive correlation".
			Correctly cited null hypothesis with **both** variables operationalised.	**3**	
			Correctly cited null hypothesis with reference to both variables, but **only one operationalised**.	**2**	
			Correctly cited null hypothesis with reference to both variables, but **neither** operationalised **OR** unclear wording.	**1**	
			The candidate has not provided any creditworthy information.	**0**	

Explain how you would conduct a correlation study to investigate if there is a relationship between the disfluencies a person makes and how anxious they feel while making a public speech. Justufy your decisions as part of your explanation. You must refer to:

- **how you would use self-selected sampling to obtain participants for the study**
- **how you would operationalise the variable 'disfluencies'**
- **how you would operationalise the variable 'anxiety'**
- **the control of one extraneous variable**

You should use your own experience of practical activities to inform your response. [15]

Question	Answer	Marks	Guidance
21*		Max = 15	

Level of response	Details of required features (RFs) included	Justification of decisions made	Reference to own practical work
Good 12-15 marks	**All 4** required features (RFs) addressed in context. **Accurate** and **detailed** knowledge and understanding of each feature in context. **Good** evidence of **application** of required features in context.	**Appropriate justification** of all decisions and *some* is contextualised. Well developed line of reasoning that is clear and logically structured.	**Explicit** reference to own practical work and clear links between own work and the planned research for each required feature, e.g. specific mention of aim or procedural features. For top band (good) 12 marks if just one RF linked, 13 marks if two, 14 marks if three and 15 if all four are linked If there is no explicit clear link between own practical work and *any* of the 4 required features caps the mark at 11 maximum. Overall mark **<u>Look at RF first:</u>** L4 Good – all 4 good (L4) in context L3 Reasonable – min 3 reasonable (L3) in context L2 Limited – min 2 limited (L2) in context or 3- 4 limited (L2) with no context L1 Basic – 1 basic (L1) (no context needed). **<u>THEN look at justifications:</u>** L4 Good – at least 2 reasonable (L3) AND at least 2 of the justifications are in context (does not have to be the reasonable ones) L3 Reasonable – at least 2 limited (L2) AND at least 1 of the justifications is in context. L2 Limited – at least 1 limited (L1) (no need for context) L1 Basic – no justification or basic justification **NB. References to experiment in justification (e.g. helps to establish cause and effect) = basic justification.**
Reasonable 8-11 marks	At least **3 required features in context**. **Reasonably accurate** and **detailed** knowledge and understanding of each feature.	**Some** appropriate **justification** of decision related to required features (if no justification in context award 8 marks). There was a line of reasoning evident with some structure.	
Limited 4-7 marks	At least **two** of the required features addressed in context **Limited application** of required features **OR** three or all four required features referred to but in a limited way	**Attempt** to justify decision(s) but weak. Evidence of some structure, but weak.	
	<u>If one required feature addressed in detail and justified in context and explicit links made to own practical work award 4 marks.</u>		
Basic 1-3 marks	At least **one** of the required features addressed. **Weak application** of required features. **OR** more than one of the required features referred to but in a very brief and/or basic way.	**None**, or if present very weak.	

RF		Details of RF
1	How to use self-selected sampling to obtain participants for the study	▪ **Good** - Clearly explained how self-selected sampling method has been carried out in their study in terms of procedural details (e.g. newspaper advert, contact details, how ended up with the final sample, e.g. the first 30 participants to contact the researcher would be included in the study) ▪ **Reasonable** – Shown reasonable attempt to explain how this has been carried out in their study (e.g. use of newspaper advert). ▪ **Limited** - Possibly defined (e.g. use of volunteers) OR unclear attempt to explain how this has been carried out in the study. ▪ **Basic** - Confuses sampling methods (i.e. alludes to some features of self-selected sampling however also includes features of other methods).
2	How you would operationalise the variable 'disfluencies'	▪ **Good** - Clear details on how 'disfluencies' will be operationalised with an outline of how data is quantified to clearly give a continuous numerical value suitable for use in a correlation. It is clear how this data is collected/measured. E.g. 'Counting the number of disfluencies such as 'erm' made in 5 minutes whilst giving a public speech'. **NB. For Good, candidates can specify time frame OR what the speech was about.** ▪ **Reasonable** - Reasonable details on how 'disfluencies' will be operationalised that lead to continuous numerical value suitable for use in a correlation. It may not be completely clear how the data is collected/measured. E.g. 'Counting the number of disfluencies made whilst giving a public speech'. ▪ **Limited** - The way 'disfluencies' is operationalised is addressed in an unclear way, e.g. doesn't refer to a public speech, doesn't make clear what a disfluency is or more than one measure indicated (e.g. two researchers/observers noting down the number of disluencies). **NB. No reference to public speaking cannot go above limited level.** ▪ **Basic** – Vague indication of how 'disfluencies' will be measured (e.g. noting disfluencies) or data not suitable for a correlation (i.e. reference to tallies in categories), e.g. 'Counting whether the participants made disfluencies or not whilst giving a public speech'.
3	How you would operationalise the variable 'anxiety'	▪ **Good** - Clear details on how 'anxiety' will be operationalised. Outline of how data is quantified to clearly give a continuous numerical value suitable for use in a correlation. It is clear how this data is collected/measured, e.g. if a rating scale is used, the ends of the scale are labelled. E.g. 'Asking people to rate on a scale of 1-10 (1 = not at all anxious and 10 = very anxious) how they felt whilst giving the public speech'. ▪ **Reasonable** - Reasonable details on how 'anxiety will be operationalised that lead to continuous numerical value suitable for use in a correlation. It may not be completely clear how the data is collected/measured. E.g. 'Asking people to rate on a scale of 1-10 how anxious they felt whilst giving the public speech'. **NB. Naming the scale incorrectly (e.g. semantic differential scale of 1-10) limits the RF to max reasonable.** ▪ **Limited** - The way 'anxiety' is operationalised is addressed in an unclear way, e.g. general measure of anxiety unrelated to public speaking/ 'Asking people to rate on a scale of 1-10 how anxious they feel' or more than one measure indicated. **NB. No reference to public speaking cannot go above limited level.** ▪ **Basic** – Vague indication of how 'anxiety' will be measured (e.g. asking about anxiety), scale is too small to be suitable for a correlation (i.e. it should span at least from 1 to 5) or data not suitable for a correlation (e.g. 'Asking the participants whether they felt anxious or not whilst giving a public speech').
4	The control of **one** extraneous variable	▪ **Good** - Clear and detailed outline of how an identified (explicit or implicit) extraneous variable. ▪ **Reasonable** - Clear outline of how an identified (explicit or implicit) extraneous variable. ▪ **Limited** - Attempts to explain how an identified (explicit or implicit) extraneous variable can be controlled. ▪ **Basic** - Identifies an extraneous variable that can be controlled. If more than one control, credit the first one. NB. Personal characteristics (e.g. being extroverted, confident, very anxious, occupation) are not creditworthy.
	Annotations	Context = disfluencies, uh, erm and ah, (public) speech, anxiety, etc. RF on the left with: **L4=Good; L3=Reasonable; L2= Limited; L1= Basic.** Context with **CONT**. Justification within the response on the right with a **TICK**. Do not annotate the level, note the level of justification to decide on the mark given within the band.

<table>
<tr><td colspan="6">Outline <u>one</u> strength and <u>one</u> weakness of conducting this study using the correlation technique. [6]</td></tr>
<tr><td colspan="3">Question</td><td>Answer</td><td>Marks</td><td>Guidance</td></tr>
<tr><td>22</td><td></td><td></td><td><u>Possible strengths:</u>
▪ Collection of quantifiable data.
▪ Can provide ideas for experimental work in future.
▪ Easy to see patterns / trends (scatter diagram) in data.
▪ More ethical as there is no manipulation of variables.
▪ Can investigate difficult to manipulate variables
▪ Often higher in ecological validity
▪ Any other appropriate point.

<u>Possible weaknesses:</u>
▪ Not possible to establish cause and effect.
▪ No details on why participants reacted / felt as they did.
▪ Often lack construct validity due to use of quantitative data
▪ Influence of third/extraneous variables
▪ Any other appropriate point.</td><td>Max 6
[3+3]</td><td>Context = disfluencies, uh, erm and ah, (public) speech, anxiety etc.

NB: Only first strength and first weakness is marked.</td></tr>
<tr><td></td><td></td><td></td><td>For each strength and each weakness…</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>Clear outline of strength/weakness in context.</td><td>3</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Clear outline of strength/ weakness but not in context. OR attempted outline of strength/weakness in context.</td><td>2</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Brief and/or weak attempt to outline strength/weakness (whether in context or not).</td><td>1</td><td></td></tr>
<tr><td></td><td></td><td></td><td>The candidate has not provided any creditworthy information.</td><td>0</td><td></td></tr>
</table>

Outline <u>one</u> weakness of using self-selected sampling in this study. [3]					
Question			**Answer**	**Marks**	**Guidance**
23			<u>Possible weaknesses:</u> ▪ Lack of control over composition of sample. ▪ Potential biased sample – volunteers more outspoken so maybe less likely to be anxious/better at public speaking, access to advert may be limited to a particular group of people etc. ▪ Participant bias/<u>increased</u> risk of demand characteristics ▪ Can be time consuming ▪ Any other appropriate point.	**Max 3**	Context = disfluencies, uh, erm and ah, (public) speech, anxiety etc. **NB.** Accept context from Q21. **NB: Only first response is marked.**
			Clear outline of appropriate weakness in context.	**3**	
			Clear outline of weakness but not in context. **OR** attempted outline of weakness in context.	**2**	
			Brief and/or weak attempt to outline strength/weakness (whether in context or not).	**1**	
			The candidate has not provided any creditworthy information.	**0**	

<table>
<tr><th colspan="6">Outline <u>one</u> ethical consideration that could be taken into account in this study. [2]</th></tr>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>24</td><td></td><td></td><td><u>Possible ethical considerations:</u>
▪ Informed consent – explaining to participants (verbally/in writing) at the start of the study that the researchers are investigating the relationship between disfluencies and anxiety.
▪ Protection of participants – For example if participants were only asked to think about/imagine anxiety levels whilst making a public speech rather than actually putting them in an anxiety/provoking situation.
▪ Debrief – explaining to participants after the study that it is normal to feel anxious/offer them support if necessary.
▪ Any other appropriate point.</td><td>Max 2</td><td rowspan="4">Context = disfluencies, uh, erm and ah, (public) speech, anxiety etc.

NB. No credit for consent – it has to be <u>informed</u> consent.

NB. Only first response is marked, therefore if candidate names respect and outlines debrief, which is not within respect principle, then cap at 1.

Respect – informed consent, right to withdraw, confidentiality
Responsibility – protection from harm, debrief
Integrity – deception
Competence</td></tr>
<tr><td></td><td></td><td></td><td>One ethical consideration clearly presented in context.</td><td>2</td></tr>
<tr><td></td><td></td><td></td><td>One ethical consideration clearly outlined but not in context. OR attempted outline of ethical consideration (whether in context or not).</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>The candidate has not provided any creditworthy information.</td><td>0</td></tr>
</table>

<table>
<tr><td colspan="5">Outline <u>two</u> ways that the validity of the data collected in this study could have been affected. [6]</td></tr>
<tr><td colspan="3">Question</td><td>Answer</td><td>Marks</td><td>Guidance</td></tr>
<tr><td>25</td><td></td><td></td><td><u>Possible answers:</u>
▪ Type of disfluencies considered – e.g. reduced validity if only one type of disfluency was counted, such as ‘erm’.
▪ If the public speech was for a real purpose (e.g. a real speech made in college for students to their peers) then the validity would be higher / an artificial public speech made solely for the purpose of the study would reduce validity.
▪ If a self-report is used to measure anxiety then participants could give socially desirable responses (lowering validity).
▪ If a self-report is used to measure anxiety then the understanding of the scale may be inaccurate (e.g. what does a score of 1 actually relate to in terms of anxiety?). This would reduce validity.
▪ Any other appropriate point.</td><td>Max 6
[3+3]</td><td rowspan="6">Context = disfluencies, uh, erm and ah, (public) speech, anxiety etc.

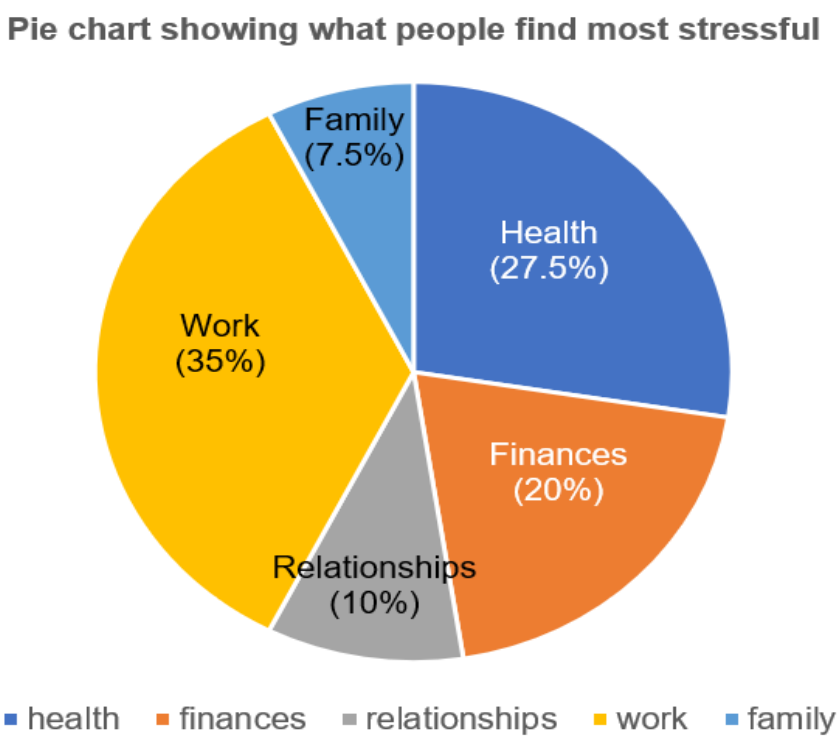
Both positive and negative ways the validity could have been affected are creditworthy, however for full marks candidate needs to make a judgement as to whether validity is <u>increased or decreased</u> as a result.

Ensure that the points made clearly relate to validity and not reliability – e.g. ‘participants may interpret the anxiety rating scale in different ways’ relates to the reliability of the scale.

NB: Population validity and ecological validity can be accepted but in order to gain above 1 mark (weak attempt at outline – whether in context or not), their answer must link back to the validity of data, e.g. since the sample is self-selected, mostly those confident in public speaking would apply, therefore the validity of conclusions drawn (based on the data in this study) about the broader population is limited.</td></tr>
<tr><td colspan="3"></td><td>3 marks for each way outlined...</td><td></td></tr>
<tr><td colspan="3"></td><td>Clear outline in context.</td><td>3</td></tr>
<tr><td colspan="3"></td><td>Clear outline but not in context. OR attempted outline in context.</td><td>2</td></tr>
<tr><td colspan="3"></td><td>Brief and/or weak attempt at outline (whether in context or not).</td><td>1</td></tr>
<tr><td colspan="3"></td><td>The candidate has not provided any creditworthy information.</td><td>0</td></tr>
</table>

Section C: Data analysis and interpretation

Sketch a fully labelled pie chart showing the data displayed in Table 1. [4]

Question	Answer	Marks	Guidance
26 (a)		**Max 4 [1+1+1+1]**	Sectors of the pie chart need only be approximate sizes (examiners do not need to check with protractor or overlay in RM assessor). Calculations are likely to be percentages but can accept degrees of circle (either within labelling of the pie chart, or separately at the side). NB. **Check whether the calculations are in the table on page 16.** **Health** 33 / 120 x 100 = 27.5% 33 / 120 x 360 = 99 degrees **Finances** 24 / 120 x 100 = 20% 24 / 120 x 360 = 72 degrees **Relationships** 12 / 120 x 100 = 10% 12 / 120 x 360 = 36 degrees **Work** 42 / 120 x 100 = 35% 42 / 120 x 360 = 126 degrees **Family** 9 / 120 x 100 = 7.5% 9 / 120 x 360 = 27 degrees
	Each feature can be awarded one mark as follows ...		
	1 mark is awarded for correctly calculating what proportion of the circle should represent each of the five stress response categories.	**1**	
	1 mark is awarded for drawing the sectors in proportional size to the data displayed.	**1**	
	1 mark is awarded for clear labelling of each sector of the pie chart.	**1**	
	1 mark is awarded for a clear and appropriate title.	**1**	

<table>
<tr><th colspan="6">Outline <u>two</u> conclusions from the data presented in this pie chart. [6]</th></tr>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>26</td><td>(b)</td><td></td><td colspan="2"><u>Example conclusions:</u>
▪ Work is regarded as most stressful, perhaps because it consumes the majority of time for people, and most people have little control over what goes on at work and need to work to earn money.
▪ Family is not a source of stress for most people, possibly because they offer a support for people in times of stress, so family may be seen as stress-reducing rather than as a stressor.
▪ Stress is subjective, shown by the fact that each of the 5 response categories was selected as being ‘the most stressful’ by some individuals, therefore what is viewed as a cause of stress to one person may not be a cause of stress to another.

Accept any other appropriate conclusions.</td><td>Max 6
[3+3]</td><td rowspan="5">Context = stress (and any of the specific stress response categories)

A conclusion must be an interpretation/application of the findings/data (not simply a statement of the result(s) obtained), i.e. offers plausible explanation of findings.

Max 1 mark for presentation of a finding with no interpretation/explanation of it.

Zero marks if just data is given.</td></tr>
<tr><td colspan="3"></td><td colspan="2">3 marks for each conclusion</td></tr>
<tr><td colspan="3"></td><td colspan="2">Clear, detailed conclusion in context.</td><td>3</td></tr>
<tr><td colspan="3"></td><td>Clear, detailed conclusion but not in context.</td><td>OR attempt at conclusion in context.</td><td>2</td></tr>
<tr><td colspan="3"></td><td>Brief and/or weak attempt at conclusion (whether in context or not).</td><td>OR simply stating a finding.</td><td>1</td></tr>
<tr><td colspan="3"></td><td colspan="2">The candidate has not provided any creditworthy information.</td><td>0</td></tr>
</table>

Use the data in Table 2 to calculate the percentage of people who answered 'yes' to the question 'Do you think stress can be a good thing?' Show your working.
Write your answer to two significant figures. [3]

Question			Answer	Marks	Guidance
27				**Max 3 [1+2]**	
			1 mark for correct workings shown, e.g. 46 / 120 x 100 OR (32+14) / (32 +14 + 28 + 46) x 100	**1**	1 mark is given for some workings shown.
			1 mark for correct answer not stated to 2 significant figures (e.g. 38.33333 **OR** 38.33 **OR** incorrectly rounded up to 39)	**1**	The other 2 marks are given if the answer is correctly stated to 2 significant figures (NB. students may only state 38% without writing the initial answer of 38.33% - this is fine for 2 marks).
			OR	**or**	
			2 marks for answer stated to 2 significant figures (38%)	**2**	
			The candidate has not provided any creditworthy information.	**0**	

Outline <u>one</u> reason why the Chi-square test would be the appropriate inferential statistical test to analyse the data in Table 2. [2]

Question			Answer	Marks	Guidance
28	(a)		<u>Any **one** reason:</u> ▪ Nominal data obtained (category data = yes/no responses) ▪ Study looking for/investigating a difference (difference between male and female responses to stress) ▪ Independent measures design (different participants in male and female groups).	**Max 2**	Context = male/female, yes/no responses **NB: Only first reason/response is marked,** therefore award context mark only if appropriate to first reason identified.
			One appropriate reason in context.	**2**	
			One appropriate reason but not in context. **OR** attempt to give one appropriate reason in context.	**1**	
			The candidate has not provided any creditworthy information.	**0**	

Use the formula provided to calculate the value of Chi-square for this data.
Use two decimal places for all calculations.
Show your working. **[5]**

Formula for Chi-Square

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Question			Answer	Marks	Guidance
28	(b)		χ^2 = **11.42**	**Max 5**	NB. 11.42 on its own max 3. Please note where candidates have calculated χ^2 cell-by-cell this is also creditworthy. Alternative ways of using the formula, providing it arrives at the correct cell value (expressed as a decimal or even fraction) and overall answer is creditworthy (e.g. some students who learn about χ^2 in different subjects may do this).

Step-by-step calculations for Chi Square

Cell	O - E	$(O-E)^2$	$(O-E)^2 / E$	$\Sigma (O-E)^2 / E$
Males / Yes	32-23 = 9	$(9)^2$ = 81	81 / 23 = 3.52	3.52 + 2.19 + 3.52 + 2.19 = **11.42**
Males / No	28-37 = -9	$(-9)^2$ = 81	81 / 37 = 2.19	
Females / Yes	14-23 = -9	$(-9)^2$ = 81	81 / 23 = 3.52	
Females / No	46-37 = 9	$(9)^2$ = 81	81 / 37 = 2.19	

OR

	Yes	No	
Males	$\frac{32-23^2}{23} = 3.52$	$\frac{28-37^2}{37} = 2.19$	3.52 + 2.19 + 3.52 + 2.19 = **11.42**
Females	$\frac{14-23^2}{23} = 3.52$	$\frac{46-37^2}{37} = 2.19$	

			Correct calculation (11.42) with most workings shown	**5**
			Correct calculation of the sum of $(O-E)^2/E$ (11.42) with some workings but not to two decimal points.	**4**
			Correct calculation of each individual $(O-E)^2/E$ value	**3**
			Correct calculation of each individual $(O-E)^2$ value	**2**
			Correct calculation of each individual (O-E) value	**1**
			The candidate has not provided any creditworthy information	**0**
			***OR** 1 mark for each set of calculations done correctly for each cell $(O-E)^2/E$ plus 1 mark for overall correct answer (χ^2 value = 11.42)	

Explain what p<0.05 would mean as part of the significance statement for the analysis of this data. [3]					
Question			**Answer**	**Marks**	**Guidance**
28	**(c)**		Example answer: *p<0.05 means there is less than a 5% probability that the results are due to chance. This means we can reject the null hypothesis that there is no difference in whether males and females think stress is a good thing or not.*	**Max 3 [1+1+1]**	Context = stress / males and females/ χ^2 value = 11.42
			1 mark for reference to a less than 5% probability that the results are due to chance OR less than 5% chance that the null hypothesis is true OR more than 95% confident that results are not due to chance	**1**	Accept 1 in 20 chance.
			1 mark for reference to rejecting the null hypothesis OR accepting the alternative hypothesis OR results being significant (as observed value was greater than critical value)	**1**	
			1 mark for the answer given in the context of the study.	**1**	
			The candidate has not provided any creditworthy information.	**0**	

<table>
<tr><td colspan="6">Outline <u>one</u> way that using a self-report method increases the reliability of the data collected in this study. [3]</td></tr>
<tr><td colspan="3">Question</td><td>Answer</td><td>Marks</td><td>Guidance</td></tr>
<tr><td>29</td><td>(a)</td><td></td><td><u>Possible answers:</u>
▪ Standardised questions that are the same for all participants means the method is replicable which allows for test-retest (external) reliability to be checked.
▪ Questionnaires are easier to replicate (potentially with a large sample)
▪ The use of closed questions as they are scored in more consistent way
▪ The use of quantitative data allows split-half (internal) reliability to be tested (by comparing scores on one half of the test with scores on the other half).
▪ Any other appropriate point.</td><td>Max 3</td><td rowspan="5">Context = stress (and any of the specific stress response categories – e.g. health, finances, relationships, work, family), 120.

NB: Only first response is marked.

Sample size can be accepted but in order to gain above 1 mark (weak attempt at outline – whether in context or not) it has to be explained in relation to statistical anomalies/outliers/flukes (and self-report), i.e. large sample makes it less likely for anomalies to skew results. In this context, questionnaire gathers quantitative data and therefore it is possible to gather data from a large sample (120 in the study).</td></tr>
<tr><td colspan="3"></td><td>Clear, detailed outline in context.</td><td>3</td></tr>
<tr><td colspan="3"></td><td>Clear, detailed outline but not in context. OR attempted outline in context.</td><td>2</td></tr>
<tr><td colspan="3"></td><td>Attempt, and/or brief outline (whether in context or not).</td><td>1</td></tr>
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<tr><td>29</td><td>(b)</td><td></td><td><u>Possible answers:</u>
▪ Ambiguous wording - participants may interpret some of the stress response categories differently to others (e.g. ‘family’ may be interpreted to mean only immediate family by some participants, but might be interpreted to mean extended family by others) and therefore inconsistent responses <u>over time or between participants.</u>
▪ Overlapping categories – relationships/family – may lead to inconsistent answers over time.
▪ Low response rates, therefore higher chance of results being inconsistent due to anomalies
▪ Participant bias – when and where they have answered the questions
▪ Participants’ mood, fatigue, distractions – can lead to inconsistent answers over time.
▪ Any other appropriate point.</td><td>Max 3</td><td rowspan="5">Context = stress (and any of the specific stress response categories – e.g. health, finances, relationships, work, family), 120.

NB: Only first response is marked.

No credit for dishonesty, lying etc.</td></tr>
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<tr><th colspan="5">Outline <u>one</u> strength and <u>one</u> weakness of using nominal data in this study. [6]</th></tr>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>30</td><td></td><td></td><td><u>Possible strengths:</u>
▪ Can conduct statistical analysis (e.g. can use the mode for type of thing causing most stress and present in a pie chart or bar chart).
▪ Easy for participants to respond about what they find stressful.
▪ Quickest level of data to gather, e.g. record headcount, simple frequency count.
▪ Quickest level of data to analyse (i.e. mode).
▪ Any other appropriate point.

<u>Possible weaknesses:</u>
▪ Restricted response categories (e.g. ‘work’, ‘family’) may not offer option participants want to best express what causes them most stress (potentially lowering validity of study).
▪ It is difficult for researchers to interpret why a certain category (e.g. work) is stressful as there is no degree of response
▪ Each individual does not get a score
▪ Can ONLY use mode (e.g. can’t use mean, median or measures of dispersion).
▪ Any other appropriate point.</td><td>Max 6
[3+3]</td><td rowspan="6">Context = stress (and any of the specific stress response categories – e.g. health, finances, relationships, work, family), males and females.

For the point to be ‘clear’ (whether in context or not), the strength/weakness must be explicitly related to the use of nominal data and not just quantitative data in general.

NB: Only first strength and first weakness is marked.</td></tr>
<tr><td></td><td></td><td></td><td>3 marks for the strength and 3 marks for the weakness</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Clear, detailed strength / weakness outlined in context.</td><td>3</td></tr>
<tr><td></td><td></td><td></td><td>Clear, detailed strength / weakness but not in context. OR attempted strength / weakness in context.</td><td>2</td></tr>
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