OCR
Oxford Cambridge and RSA

GCE

Psychology

H567/01: Research methods

A Level

Mark Scheme for June 2023

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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.

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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 Assessor3 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 posted on the RM Cambridge Assessment Support Portal http://www.rm.com/support/ca

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

Check with instructions: YOU MUST MARK 5 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS. 1

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 Assessor3 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 or the RM Assessor3 messaging system, or by email.

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 a tick to confirm that the work has been seen.

7. Award No Response (NR) if:
    - there is nothing written in the answer space

   Award Zero '0' if:
    - anything is written in the answer space and is not worthy of credit (this includes text and symbols).

   Team Leaders must confirm the correct use of the NR button with their markers before live marking commences and should check this when reviewing scripts.

8. The RM Assessor3 **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.**

   If you have any questions or comments for your team leader, use the phone, the RM Assessor messaging system, or e-mail.

9. A*ssistant 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:
    a. **To determine the level** – start at the highest level and work down until you reach the level that matches the answer
    b. **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

Annotation	Meaning
BP	Blank page
?	Meaning unclear
✗	Incorrect
✓	Correct
^	Missing information
	Relevant information
CONT	Context
NAQ	Not answering question
REP	Repeats
SEEN	Seen (to show content on page has been noted but not credited)
BOD	Benefit of doubt given
IRRL	Irrelevant
EVAL	Evaluation
L1	RF is basic
L2	RF is limited
L3	RF is reasonable
L4	RF is good

Section A: Multiple choice

Ques	Answer	
1	B	competence
2	A	8:3
3	D	percentage
4	A	Chi-square
5	D	Wilcoxon
6	B	data that is obtained directly from the sample by the researcher(s)
7	A	a type 1 error
8	B	covert
9	A	dispersion around the mean
10	C	35%
11	B	independent measures
12	B	1/20
13	B	3.5
14	C	normal
15	B	Mann-Whitney U test
16	D	25.90
17	A	alternative measures
18	A	creative
19	A	concurrent
20	C	mode

Section B: Research design and response

A clean smell?

The aroma of freshly baked bread, the smell of newly ground coffee and the scent of a nice fragrance. We associate different smells with different people and situations, and our sense of smell can even influence how we behave. Sometimes this can be immediate and direct, such as making us feel hungry, but it can also be more indirect. For example, the smell of lemons is often associated with cleanliness. To study this further, psychologists want to use the experimental method to investigate if people leave less litter in a room filled with the smell of lemons compared to one that smells of nothing.

Write a one-tailed alternative hypothesis for this study.				
Question		**Answer**	**Marks**	**Guidance**
21		For example: There will be less pieces of litter left in a room (waste paper, food packets etc) when the room smells of lemons compared to a room that smells of nothing.	**Max 3**	Context = aroma, smell, scent, fragrance, litter, any example of litter (e.g. wrappers, rubbish), cleanliness etc Can be written in future or present tense. Use of the word 'significant' is not necessary for full marks. Award zero if a *two-tailed* hypothesis or *null* hypothesis. Award zero if correlational hypothesis For full marks both the variables must be operationalised: IV – both levels/conditions must be given (e.g. smell of lemons, no lemon smell/smells of nothing). Credit description of the smell using other words such as odour, aroma etc DV – need to specify how amount of litter will be measured (e.g. number of pieces/items of litter, weight of litter, etc) 'Amount of litter' is **not** operationalised.
		Correctly cited one-tailed alternative hypothesis with both variables operationalised	**3**	
		Correctly cited one-tailed alternative hypothesis with reference to both variables, but only one operationalised	**2**	
		Correctly cited one-tailed alternative hypothesis with reference to both variables, but neither operationalised	**1**	
		The candidate has not provided any creditworthy information	**0**	

Explain how you would conduct a study using the laboratory experimental method to investigate if there is a difference in the amount of litter left in a room filled with the smell of lemons compared to a room that has no smell. Justify your decisions as part of your explanation.

You must refer to:

- **the sampling technique used to obtain participants for the study**
- **how you would operationalise the dependent variable to obtain quantitative data**
- **details of how one ethical consideration would be addressed**
- **the control of one extraneous variable**

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

Question	Answer	Marks	Guidance
22		**Max = 15**	Context = aroma, smell, scent, fragrance, litter, any example of litter (e.g. wrappers, rubbish) cleanliness etc **Annotations** **RF** (in the left column AND see next page for descriptors of the levels for description of the RF) **L4=Good; L3=Reasonable; L2= Limited; L1= Basic** **Annotate with CONT for context if RF in context.** (under RF level annotation on left) **Tick for justification within the response** Do not annotate the level, note the level of justification to decide on the mark given within the band

What you are being **driven** by is the left-hand column of the grid ('details of the required features (RFs)'. That is always your starting point and 'locator' for the appropriate mark band before considering the other two columns ('justification of decisions made' and 'reference to own practical work').

<table>
<tr><th>Level of response</th><th>Details of required features (RFs) included</th><th>Justification
of decisions made</th><th>Reference to own practical work</th></tr>
<tr><td>Good
12-15 marks</td><td>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</td><td>Appropriate justification of all decisions and some is contextualised

Well-developed line of reasoning that is clear and logically structured</td><td rowspan="5">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 explicitly linked, 13 marks if two, 14 marks if three and 15 if all four are linked explicitly.
If there is no explicit clear link between own practical work and any of the 4 required features caps the mark at 11 maximum.

Maximum 11 marks (reasonable) if clearly done as a field experiment.

Overall Mark
Decide on band and final mark

Look at RF first
L4 Good – all 4 good (L4) in context
L3 Reasonable – min 3 reasonable (L3) in context (could be 1 good and 2 reasonable OR 2 good and 1 reasonable)
L2 Limited – min 2 limited (L2) in context or 3-4 limited (L2) with no context
L1 Basic – 1 basic (L1) (no context needed).
THEN look at justifications
Make judgement of which mark to give the response within the band based on the justifications
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 (8 marks if none contextualised OR meets the minimum justification requirement).
L2 Limited – at least 1 limited (L1) (none have to be in context)
OR If one required feature addressed in detail (good) and justified in context and explicit links made to own practical work award 4 marks
L1 Basic – no justification or basic justification</td></tr>
<tr><td>Reasonable
8-11 marks</td><td>At least 3 required features in context

Reasonably accurate and detailed knowledge and understanding of each feature</td><td>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</td></tr>
<tr><td rowspan="3">Limited
4-7 marks</td><td>At least two of the required features addressed in context

Limited application of required features</td><td rowspan="2">Attempt to justify decision(s) but weak

Evidence of some structure, but weak</td></tr>
<tr><td>OR three or all four required features referred to but in a limited way</td></tr>
<tr><td colspan="2">If one required feature addressed in detail and justified in context and explicit links made to own practical work award 4 marks</td></tr>
<tr><td rowspan="2">Basic
1-3 marks</td><td>At least one of the required features addressed
Weak application of required features</td><td rowspan="2">None, or if present very weak</td></tr>
<tr><td>OR more than one of the required features referred to but in a very brief and/or basic way</td></tr>
</table>

RF		Details of RF
1	Sampling technique	• Good – Identified the sampling method and clearly explained where and how this has been carried out in their study. Details of how the sampling method is enacted/procedural details e.g. how the P is contacted, is approached or gets in touch with experimenter or becomes part of the sampling pool (e.g using everyone in that location). • Reasonable – Identified the sampling method, possibly defined AND reasonable attempt to explain how this has been carried out in their study. • Limited – Sampling method identified and defined OR unclear attempt to explain how this has been carried out in their study. • Basic – Just identifying the sampling technique or confuses sampling methods.
2	Operationalising DV	• Good – Clear details on how dependent variable will be operationalised. Outline how data is quantified and how/when the litter is counted (e.g. how weight is measured or unit of measure, comparison of amount before/after, number of pieces in the bin, tally of number of pieces of litter). • Reasonable – Reasonable details on how dependent variable will be operationalised that does lead to quantitative data e.g. count the number of pieces of litter/number of wrappers. May include a muddled/vague indication of where and how this has been carried out in their study. • Limited – Way DV is operationalised is quantitative and addressed in a limited/unclear way. E.g. does not indicate which litter is being counted, more than one measure indicated; Could indicate where the litter has come from and 'amount of litter left in the room'. • Basic – Vague indication of how DV would be measured (e.g. amount of litter left in the room).
3	One ethical consideration addressed	Integrity (deception) Respect (privacy/confidentiality/consent/right to withdraw), Responsibility (debrief/no psychological or physical harm unlikely to be creditworthy unless clear how their study could be psychologically or physically harmful), Competence (refers to the competence of the researcher e.g. get an expert in to check for sensory impairments) • Good – Identifying the ethical consideration, explaining the ethical consideration and clarity on how it can be addressed. • Reasonable – Identifying the ethical consideration and reasonable explanation of how it can be addressed. Briefly addressed but lacks clarity. • Limited - Limited explanation with some understanding of the ethical consideration (e.g. outline of how to address ethical consideration possibly without identifying). • Basic – Just identifies the ethical consideration. If candidate clearly does more than one consideration, credit the first one. Allow ethical considerations which are clearly connected to each other/influence each other. There may be a mislabelling of the ethical principle. Therefore, if the RF meets the requirements of the description, it can be put at this level. This RF needs to focus on the way the ethical consideration is addressed. Any information given on the reason is justification.
4	Control of one Extraneous variable	• Good – Clear and somewhat detailed of how EV can be controlled. • Reasonable – Reasonable outline of how EV can be controlled. • Limited – Limited/brief outline of how EV can be controlled is unclear. • Basic – Identifies how EV can be controlled or is muddled. If more than one extraneous variable, credit the first one.

An independent measures design could have been used in this study.
(a) Outline one strength of using an independent measures design in this study.

Question			Answer		Marks	Guidance
23	(a)		Likely answers: no order effects e.g. practice or boredom, fewer demand characteristics as participants are unaware of the other condition and so will not adapt their behaviour, etc		**Max 3**	Context = aroma, smell, scent, fragrance, litter, any example of litter (e.g. wrappers, rubbish) cleanliness etc For 3 marks the response needs to explain why this is a strength. Order effects and guessing the aim of the study/demand characteristics are two separate strengths. Credit the first strength.
			Clear outline of strength in context		**3**	
			Clear outline of strength but not in context	**OR** attempted outline of strength in context	**2**	
			Brief and/or weak attempt to outline strength (whether in context or not)		**1**	
			The candidate has not provided any creditworthy information		**0**	

Outline one weakness of using an independent measures design in this study.

23	(b)		Likely answers: problem of individual differences (participant variables), and more participants required overall etc		**Max 3**	Context = aroma, smell, scent, fragrance, litter, any example of litter (e.g. wrappers, rubbish) cleanliness etc For 3 marks the response needs to explain why this is a weakness. Credit the first weakness.
			Clear outline of weakness in context		**3**	
			Clear outline of weakness but not in context	**OR** attempt in context	**2**	
			Brief and/or weak attempt to outline weakness (whether in context or not)		**1**	
			The candidate has not provided any creditworthy information		**0**	

Suggest one open question you could use to obtain some additional information in this study.					
Question			**Answer**	**Marks**	**Guidance**
24	**(a)**		For example – What do you think about people who drop litter?	**Max 2**	Context = aroma, smell, scent, fragrance, litter, any example of litter (e.g. wrappers, rubbish) cleanliness etc
			Clear suggestion in context	**2**	
			Clear suggestion but not in context **OR** attempt in context	**1**	Example 1 mark responses Ask the participants to have a discussion about litter. = Attempt in context Describe how you feel today. = Clear suggestion but not in context.
			The candidate has not provided any creditworthy information	**0**	

Evaluate the use of this open question in this study.					
24	**(b)**		Answers here are dependent upon the specific question the candidate has suggested in the previous question. Likely answers – Strengths – in-depth data, allows deeper understanding of participants' views/behaviour in the study, could lead to useful applications for reducing litter due to deeper understanding, etc Weaknesses – subjectivity/bias in interpretation of response, harder/more difficult to do (statistical) analysis/comparison of data, etc	**Max 3**	Context = aroma, smell, scent, fragrance, litter, any example of litter (e.g. wrappers, rubbish) cleanliness etc Context can be from the question that they ask in 24(a) unless their question has achieved 1 mark as clear but not in context. Credit the evaluation of their question (e.g. is a leading question, uses words participants may not know etc) No credit for just identifying that it is qualitative data (with no indication of why this is a strength or what the strength is) The response can be awarded full marks with either just strengths or just weaknesses or a combination.
			Clear evaluation in context	**3**	
			Clear evaluation but not in context **OR** attempt in context	**2**	
			Brief and/or weak attempt (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

<table>
<tr><td colspan="7">Evaluate the use of the laboratory experimental method in this study.</td></tr>
<tr><td rowspan="6">25</td><td rowspan="6"></td><td rowspan="6"></td><td colspan="3">Positive evaluation points could include reference to standardisation and control features able to be employed (e.g. same level of aroma in rooms, room layout made consistent across conditions) etc
Negative evaluation points could include possible issues related to demand characteristics and possible reduction in ecological validity (depending on how conducted) etc</td><td>Max 6</td><td rowspan="6">Context = aroma, smell, scent, fragrance, litter, any example of litter (e.g. wrappers, rubbish) cleanliness etc

Annotation – CONT for when the point is in context.

Accept positive and/or negative evaluation points as creditworthy

Do not accept as creditworthy comments related to choice of experimental design as this is not the experimental method

1-2 marks could include a number of points but not developed (whether in context or not)</td></tr>
<tr><td colspan="2">5 marks
One clear evaluation point in context and one attempt whether in context or not
OR Clear evaluation with two or more points with one in context</td><td colspan="2">6 marks
Clear evaluation with two or more points in context</td><td>5-6</td></tr>
<tr><td>Clear evaluation with two or more points but not in context</td><td colspan="2">OR one clear evaluation point in context</td><td>4 marks
Attempt at two points or more points, one in context and one not in context
3 marks
Attempt at one point in context and one or more brief or weak attempt at evaluation (whether in context or not)</td><td>3-4</td></tr>
<tr><td colspan="2">Brief or weak attempt at evaluation (whether in context or not)</td><td colspan="2">One clear evaluation point but not in context</td><td>1-2</td></tr>
<tr><td colspan="4">The candidate has not provided any creditworthy information</td><td>0</td></tr>
</table>

Section C Data analysis and interpretation

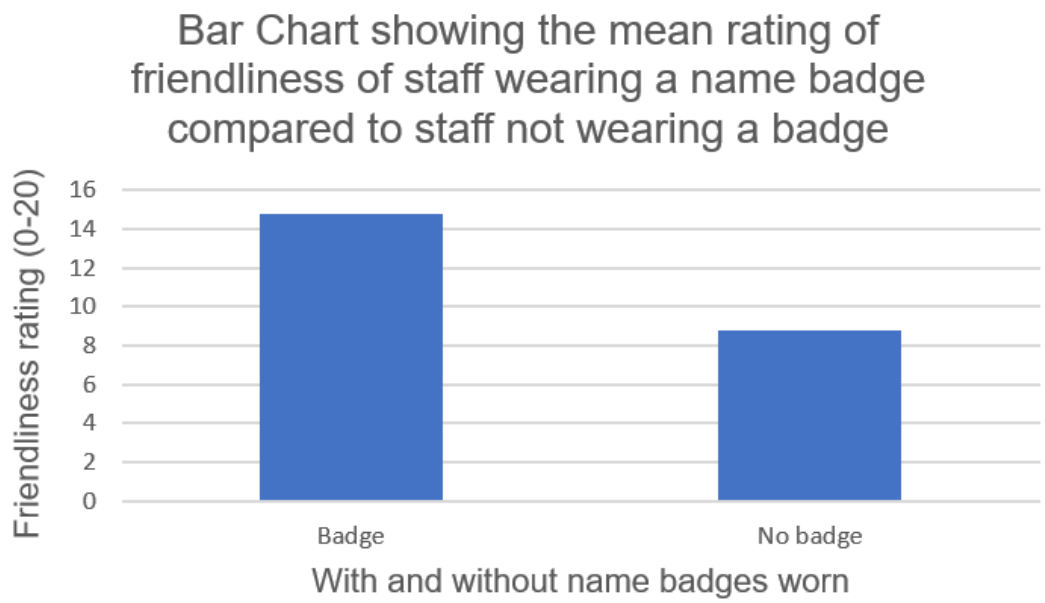
A friendly name?

Research suggests many things can influence how friendly a person is thought to be. Personality is an obvious one and sense of humour is another. However, there are also less obvious things, such as just knowing a person's name. A psychologist investigated this using an independent measures design experiment. They compared the ratings of friendliness given to shop assistants who wore a name badge to those who did not. Some of the data collected is presented in the table below.

Ratings of friendliness (0 to 20) given to shop assistants who were wearing a name badge compared to shop assistants who were not (0 = 'not friendly at all' to 20 = 'extremely friendly')

Wearing name badge		Not wearing name badge	
Rating	Rank	Rating	Rank
18	17	13	11
14	12	2	1
10	8	6	5
17	15	4	3
16	14	8	7
18	17	18	17
5	4	7	6
11	9	15	13
20	20	12	10
19	19	3	2

Question			Answer	Marks	Guidance
Explain what ranking the data means.					
26	(a)		Ranking data refers to assigning numbers to denote position in an ordered sequence (lowest to highest or vice versa)	Max 2	For example - 1 mark – order the scores/numbers lowest to highest; highest to lowest; OR numerical order 2nd mark –explaining how the ranks are assigned e.g. 1 for the lowest, up to 20 for the highest OR explaining what ranking the data means
			Clear explanation	2	
			Attempted explanation/e.g. how to do ranking	1	
			The candidate has not provided any creditworthy information	0	
Explain why there are three ranks of 17.					
26	(b)		Because there are three friendliness ratings of 18, covering ranks 16, 17 and 18 collectively. Therefore, the ranks must be shared (16 + 17 + 18 = 51/3= 17)	Max 2	1 mark for identifying that identical numbers need to have the same rank OR identifying that there are three ratings of 18 2nd mark for how you calculate what that rank should be (mean or median or showing how this is done)
			Clear explanation	2	
			Attempted explanation	1	
			The candidate has not provided any creditworthy information	0	
Calculate the mean rating of friendliness in each condition. Show your workings.					
27			Wearing name badge condition = 14.8 Workings 18+14+10+17+16+18+5+11+20+19 = 148 (148/10 = 14.8) No badge condition = 8.8 13+2+6+4+8+18+7+15+12+3 = 88 (88/10 = 8.8)	Max 3	Context not required Credit workings for full marks as (both included) - 148/10 = 14.8 88/10 = 8.8
			Correct calculation of mean in both conditions with workings for both	3	
			Correct calculation of mean in both conditions with workings for one OR correct calculation of mean in both conditions but no workings OR correct calculation of mean in one condition with workings	2	Credit all results for one condition on one line divided by 10 on the next e.g. $\frac{18+14+10+17+16+18+5+11+20+19}{10}$ = 14.8 Credit rounding up 15 and 9
			Correct calculation of mean for one condition with no workings OR Correct workings with incorrect mean	1	
			The candidate has not provided any creditworthy information	0	

Draw a fully labelled bar chart showing the mean rating of friendliness in each condition in this study.				
Question		**Answer**	**Marks**	**Guidance**
28	**(a)**		**Max 4**	Context = friendliness, friend, name, badge etc Title must include both variables ([mean] rating of friendliness and name badges/no name badges). Response must make it clear that this is the **mean** rating of friendliness in either title or y axis, if not max 3 Labels on axes must be clear. X axis – badge/not wearing badge (or similar wording) Y axis – rating of friendliness and measurement must start at 0 (does not need to go up to 20 and can go beyond 20). If two bars are together do not award mark for correct presentation of data.
		1 mark is awarded for correct presentation of data 1 mark is awarded for clear labelling of the x axis 1 mark is awarded for clear labelling of the y axis including measurement must start at 0 (does not need to go up to 20) 1 mark is awarded for fully operationalised title		
		All 4 features from above	**4**	
		Any 3 features from above	**3**	
		Any 2 features from above	**2**	
		Any 1 feature from above	**1**	
		The candidate has not provided any creditworthy information	**0**	

<table>
<tr><td colspan="6">Outline one conclusion that can be reached from the information in this bar chart.</td></tr>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td rowspan="7">28</td><td rowspan="7">(b)</td><td rowspan="7"></td><td colspan="2">For example:
Staff wearing a name badge were perceived as more friendly compared to those not wearing a name badge. This is perhaps because it was more personal and made customers feel that they knew the person better and could interact and relate to them more.</td><td>Max 4</td><td rowspan="7">Context = friendliness, friend, name, badge etc

Note: a conclusion must be an interpretation/application of the findings / data (not simply a statement of the result(s) obtained)

No credit for stating just the mean scores (e.g. the mean friendliness score for wearing a badge is 14.8=0)

Max 2 marks if only findings presented.
For example -
Staff wearing a name badge were perceived as more friendly (1) compared to staff not wearing a name badge(1).

Needs to state the direction of the findings. If not, max 1 if just findings presented e.g. there is a difference in perceived friendliness rating if the staff wore a badge or not.</td></tr>
<tr><td colspan="2">Clear conclusion in context that refers to the findings.</td><td>4</td></tr>
<tr><td>Attempted conclusion in context that refers to the findings.</td><td>Clear conclusion in context and attempt to refer to findings.</td><td>3</td></tr>
<tr><td>Attempted conclusion in context.</td><td>Clear conclusion not in context</td><td>2</td></tr>
<tr><td colspan="2">Unclear and/or brief conclusion (whether in context or not)</td><td>1</td></tr>
<tr><td colspan="2">The candidate has not provided any creditworthy information</td><td>0</td></tr>
</table>

Explain why it may have been better to use the median to calculate the measure of central tendency in this study rather than the mean.					
29			Because the data contains outliers (e.g. in the wearing badge condition the rating of 5, which is much lower than any other rating) and the median is less sensitive measure of central tendency when there are outliers.	**Max 2**	Context = friendliness, friend, name, badge etc OR 5 AND/OR 18 1 mark response – identifying the anomaly/extreme value 2 marks – **example** from the data (5 or 18) and reference to the median not being affected by anomalies (and the mean is). Award credit to - Median is the most appropriate with ordinal data. (1) and reason why- This is because ordinal data is a less precise measurement than interval data.(1) OR Median is less sensitive and is therefore more appropriate for ordinal data.(1)
			Clear explanation in context	**2**	
			Attempted explanation in context / Clear explanation no context	**1**	
			The candidate has not provided any creditworthy information	**0**	

Calculate the U value for the data collected in this study using the Mann-Whitney U test formula provided. Show your workings.					
30	**(a)**		U1 = 135 – 110/2 = 80 U2 = 75 – 110/2 = 20 (U1 and U2 are inter-changeable in terms of order candidates choose to do them) U = 20 1 mark for each of the following correct / evident in answer . • 135 • 75 • correct calculation of U2 value obtained OR correct calculation of U1 value • All workings shown for U2 • Correct U value (20)	**Max 5**	= 20 is creditworthy (rather than U=20) or circling the correct U value.
			All 5 features from above	**5**	
			4 features from above	**4**	
			3 features from above	**3**	
			2 features from above	**2**	
			1 feature from above	**1**	
			The candidate has not provided any creditworthy information	**0**	
The table below shows critical values at the 5% level of probability for the Mann-Whitney U test. Using the table, state the critical value and explain how you found this.					
30	**(b)**		Found by using the sample size in each condition Table critical value = 23	**Max 2**	Credit N1/N2 or Na/Nb Credit Na = 10; Nb = 10 as the explanation 1 mark for indicating the critical value in the table and not in the answer space
			Explanation provided and correct critical value stated	**2**	
			Explanation only provided **OR** critical value only provided	**1**	
			The candidate has not provided any creditworthy information	**0**	

Write the significance statement for the analysis performed on this data.					
Question			**Answer**	**Marks**	**Guidance**
30	**(c)**		U = 20, n1 = 10, n2 = 10, p<0.05 OR U=20, critical value = 23, 20<23, p<0.05 **OR** In words ... e.g. the alternative hypothesis (that there would be/is a significant difference in perceived friendliness between shop assistants wearing a badge and those who don't) is supported. This is because the calculated value (20) is less than the critical value (23).	**Max 2**	Credit N1/N2 or Na/Nb Cannot credit any p value other than .05 or 5% For worded statements 1 mark for each of the following: • Comparison between calculated value and critical value • Significance level (p<0.05)/'it is significant'/alternative hypothesis is supported/null hypothesis is rejected Max 1 mark if candidate contradicts themselves about whether it is significant but does state the correct comparison of calculated value and critical value.
			Correctly written significance statement **OR** written in words rather than a formal statement	**2**	
			Just stating p<0.05 **OR** weak and/or brief written response	**1**	
			The candidate has not provided any creditworthy information	**0**	

No qualitative data was collected in this study. Explain why this is a weakness of this study.					
31			Likely answers: lacks depth so we don't know reasons why wearing a name badge or not influences perceived friendliness; doesn't allow for consideration of other (extraneous) influences (e.g. physical features of person etc); May lack ecological validity as not how we would consider friendliness i.e. in number format	**Max 3**	Context = friendliness, friend, name, badge etc
			Clear and precise explanation in context	**3**	
			Clear explanation but not in context **OR** attempted explanation in context	**2**	
			Brief and/or weak attempt (whether in context or not)	**1**	
			The candidate has not provided any creditworthy information	**0**	

Identify and explain two factors that could have affected the reliability of the data collected in this study.					
Question			**Answer**	**Marks**	**Guidance**
32			Credit answers which explain how reliability was maintained, increased or reduced. Likely answers: Consistency may be reduced by: Participants variables may produce an inconsistent/subjective view of -the shop assistants who may be perceived as more friendly than others by different participants in different conditions. Different physical features of the shop assistants may be perceived as more friendly than others by different participants used in the badge wearing / non-badge wearing conditions. Different interpretations of the 0-20 rating scale for friendliness by different participants. Different behaviour of the shop assistants (this would probably be standardised as it was a research set up) when interacting with customers (and how long spent in their company, etc). Social desirability bias could have affected participants differently, (make sure it is linked clearly to lack of consistency, not accuracy). Consistency could have been increased by: Standardised question increasing consistency as pre-set scale given. Shop assistants are likely to behave in a similar way with each customer so this could be considered standardised behaviour of shop assistants allowing replicability. Quantitative data is an objective measure so there is no inconsistency in the researcher interpreting the 0-20 ratings given by the participant. Up to 3 marks for each factor	**3 + 3**	Context = friendliness, friend, name, badge, shop assistants etc **Annotation – up to 3 ticks per factor** No credit for reference to population validity or generalisability. Credit responses that refer to replicability.
			Identification of a relevant factor with a clear and precise explanation in context	**3**	
			Identification of a relevant factor with a clear explanation but not in context / Identification of a relevant factor with an attempt at an explanation in context	**2**	
			Identification of a relevant (contextual) factor but no/very weak explanation	**1**	

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