Section C Psychological Research and Scientific Method

Answer **all** questions in this section.

This topic carries 35 marks.

Topic: Psychological Research and Scientific Method

A teacher has worked in the same primary school for two years. While chatting to the children, she is concerned to find that the majority of them come to school without having eaten a healthy breakfast. In her opinion, children who eat 'a decent breakfast' learn to read more quickly and are better behaved than children who do not. She now wants to set up a pre-school breakfast club for the children so that they can all have this beneficial start to the day. The local authority is not willing to spend money on this project purely on the basis of the teacher's opinion and insists on having scientific evidence for the claimed benefits of eating a healthy breakfast.

1 9 Explain why the teacher's personal opinion cannot be accepted as scientific evidence. Refer to some of the major features of science in your answer. *(6 marks)*

A psychologist at the local university agrees to carry out a study to investigate the claim that eating a healthy breakfast improves reading skills. He has access to 400 five-year-old children from 10 local schools, and decides to use 100 children (50 in the experimental group and 50 in the control group). Since the children are so young, he needs to obtain parental consent for them to take part in his study.

2 0 The psychologist used a random sampling method. Explain how he could have obtained his sample using this method. *(3 marks)*

2 1 Explain limitations of using random sampling in this study. *(3 marks)*

2 2 Explain why it is important to operationalise the independent variable and the dependent variable in this study and suggest how the psychologist might do this. *(5 marks)*

2 3 The psychologist used a Mann-Whitney test to analyse the data. Give **two** reasons why he chose this test. *(2 marks)*

2 4 He could have used a matched pairs design. Explain why this design would have been more difficult to use in this study. *(2 marks)*

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SECTION C PSYCHOLOGICAL RESEARCH AND SCIENTIFIC METHOD

Question Stem

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Question 19

AO2/3 = 6 marks

Candidates need to show that they understand what differentiates opinion from scientific evidence. They could mention some of the following:

- The teacher has only experienced one school in a particular catchment area so she has only observed a very limited number of 5 year-olds (issues of sampling and replicability).
- She has found out that children do not eat anything nourishing simply by chatting with the children. She has no corroborative evidence from eg parents (issues of objectivity).
- She uses vague phrases such as 'decent breakfast' without being clear what this means (operationalisation).
- She has generated a theory and made predictions based on flimsy evidence.
- She has not used any scientific method to lead to her conclusions eg a carefully controlled experiment, survey or observation.
- She has drawn conclusions about the effects of breakfast without considering other variables which might affect reading skills and behaviour.

AO2/3 Mark bands

6 marks Effective	Explanation demonstrates sound understanding. Application of knowledge is effective and shows coherent elaboration. Ideas are well structured and expressed clearly and fluently. Consistently effective use of psychological terminology.
5 - 4 marks Reasonable	Explanation demonstrates reasonable understanding. Application of knowledge is reasonably effective and shows some elaboration. Most ideas appropriately structured and expressed clearly. Appropriate use of psychological terminology.
3 - 2 marks Basic	Explanation demonstrates basic, superficial understanding. Application of knowledge is basic. Expression of ideas lacks clarity. Limited use of psychological terminology.
1 mark Rudimentary	Explanation is rudimentary, demonstrating very limited understanding. Application of knowledge is weak, muddled and may be mainly irrelevant. Deficiency in expression of ideas results in confusion and ambiguity. The answer lacks structure, often merely a series of unconnected assertions.
0 marks	No creditworthy material is presented.

Question 21

AO2/3 = 3 marks

Candidates could focus on:

- Even if a sample is random, it may not be truly representative of the population eg might all come from the same school, or be all boys or all girls.
- Practical limitations eg the time and effort needed to write out 400 slips for the manual method.
- Difficulties of obtaining a truly random sample eg even if the sample is selected randomly, parents might refuse to allow their children to participate.

Any plausible and appropriate answers should be credited.

Up to 2 marks for identification of limitations. For 3 marks, one or more limitations must be explained in reasonable detail.

Question 22

AO2/3 = 5 marks

There are two requirements to this question, **why** operationalising variables is important and **how** to operationalise the IV and the DV. If a candidate only explains **how/why**, maximum 3 marks.

The terms' 'decent breakfast' and 'reading skills' are vague. It is important from the point of view of objectivity, replicability and control of extraneous variables to make sure that these terms are closely defined.

Suggestions as to how the psychologist might do this could include the following:

The researcher needs to specify the exact composition of the breakfast (possibly by doing a pilot study or a literature search to identify the components of breakfast most likely to bring about behavioural/cognitive change). He probably also needs to specify the time at which it is consumed. The researcher needs to use a standard reading test which should be administered to all the participants at the beginning of the study and at the end – the dependent variable is likely to be the improvement score.

Question 23

AO2/3 = 2 marks

Reasons are:

- a test of difference
- data (scores from a reading test) are at least ordinal, this would include ordinal/interval and/or ratio
- independent design

One mark for each appropriate reason (maximum 2 marks).

Question 26

AO3 = 12 marks

Question Stem

The psychologist asks some of his students to conduct a separate observational study at the same time on the same group of children. The aim of this observational study is to test the idea that eating a healthy breakfast affects behaviour.

Design should be written clearly, succinctly and with sufficient detail for reasonable replicability.

Candidates will not receive credit for details included in the stimulus material. These include using a random sample of 100 children, gaining parental consent and selection of a Mann Whitney test.

To access marks in the top band candidates must state an appropriate hypothesis in which "playground behaviour" is clearly operationalised. The hypothesis could be directional or non-directional.

Given the wording of the question, a correlational hypothesis is not credit worthy, however, the rest of the answer should be marked on its merits.

Likely aspects of "playground behaviour" would include activity levels, aggression, co-operative play etc.

An attempt to operationalise "a healthy breakfast" should be credited. However, candidates could assume this had already been done by the psychologist.

As this is an observational study any of the following, together with appropriate justification, would be credit-worthy:-
Is the observation covert or overt?
Where are observers positioned? (In playground, watching from window?)
Is a video recording of the children used? How will this be analysed (eg content analysis)?
Do the students who observe know what the children ate for breakfast?
At what times of day does the observation take place?
How many children are observed? (Candidates could justify using a smaller sub-sample of the 100 children in the original study)
How long does each observation last?
Will the observers use a behavioural check list/tally chart?
Will more than one observer observe each child? If so, what training will be given and what checks for inter-observer reliability will take place?
Reference to time sampling or event sampling.

Credit any other relevant material.