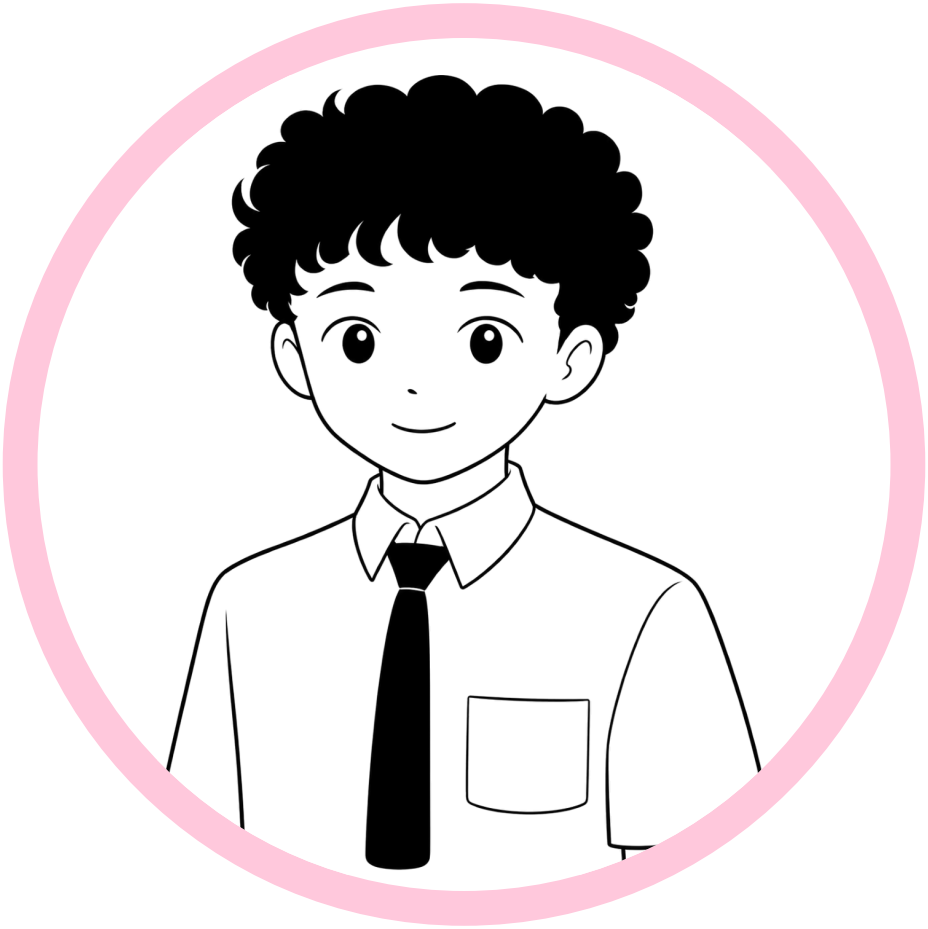
AQA A-LEVEL PSYCHOLOGY · 7182

PSYCHOLOGY



MARK SCHEME

3.2.2 WAYS OF STUDYING THE BRAIN

SCORE	PERCENTAGE
/14	%

STEMUP

These questions belong to AQA, not to us.

The examination questions, mark schemes and examiner reports in this pack were written and published by AQA. They are past assessment materials, reproduced here so that students can revise from them.

What we do not own

STEMUP is not affiliated with AQA and does not own, and makes no claim to own, any of the question, mark scheme or examiner report material in this pack. AQA has not endorsed, approved or been involved in the production of it. AQA and the qualification titles used here belong to their respective owners and appear for identification only.

Where to find the originals

AQA publishes its past papers, mark schemes and examiner reports free of charge. Always check the current specification at aqa.org.uk before you revise, because content and wording can change between series.

If you hold the rights to any material in this pack and would like it amended or removed, contact admin@stemup.co.uk and we will act on it.

Q1.

[AO1 = 3 AO3 = 5]

Level	Marks	Description
4	7 – 8	Knowledge of one or more ways of studying the brain is accurate with some detail. Evaluation is thorough and effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear, coherent and focused. Specialist terminology is used effectively.
3	5 – 6	Knowledge of one or more ways of studying the brain is evident but there are occasional inaccuracies/omissions. Evaluation is mostly effective. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is used appropriately.
2	3 – 4	Limited knowledge of one or more ways of studying the brain is present. Focus is mainly on description. Any evaluation is of limited effectiveness. The answer lacks clarity, accuracy and organisation in places. Specialist terminology is used inappropriately on occasions.
1	1 – 2	Knowledge of one or more ways of studying the brain is very limited. Evaluation is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

Possible content:

Candidates are most likely to describe the techniques described on the specification (outlined below) but examiners should be aware of other methods candidates may use such as lesion studies or CAT/PET scans.

- fMRI – uses magnetic field and radio waves to monitor blood flow; it measures the change in the energy released by haemoglobin, reflecting activity of the brain (oxygen consumption) to give a moving picture of the brain; activity in regions of interest can be compared during a base line task and during a specific activity
- EEGs – electrodes are put on the scalp and detect neuronal activity directly below where they are placed; differing numbers of electrodes can be used depending on focus of the research
- ERPs – electrodes are put on the scalp and detect neuronal activity (directly below where they are placed) in response to a stimulus introduced by the researcher
- post-mortem examinations – brain is examined after death to try and correlate structural abnormalities/damage to behaviour.

Possible evaluation:

- fMRI captures dynamic brain activity as opposed to MRI/post-mortem examinations which purely show physiology

STEMUP.CO.UK

- interpretation of fMRI is complex and is affected by temporal resolution, biased interpretation and by the baseline task used
- fMRI research is expensive leading to reduced sample sizes which negatively impact the validity of the research
- EEGs and ERPs are cheaper so can be more widely used in research
- EEGs and ERPs have poor spatial resolution
- post-mortem examinations may lack validity due to small sample sizes (as special permission needs to be granted) and also due to neuronal changes during and after death
- advantages of investigating brain activity in humans rather than generalising from animal lesion/single electrode recording studies (for validity and ethical reasons)
- comparisons between techniques is an effective source of evaluation marks
- research studies are creditworthy as long as they are effectively used to evaluate the technique(s) described.

Credit other relevant material.

Q2.

[AO1 = 2]

2 marks for clear outline of the key difference: EEG is a recording of general brain activity usually linked to states such as sleep and arousal, whilst ERPs are elicited by specific stimuli presented to the participant.

1 mark for a muddled / vague answer that shows some understanding of general state vs specific response.

Note - question is about differences, so no credit for simply describing the technique.

Q3.

[AO1 = 1]

Correct answer: C

Q4.

[AO3 = 3]

Up to three marks for a brief evaluation of the use of EEGs. Credit up to 3 separate evaluative points or one point fully elaborated or a combination of these.

Likely points: safe way of measuring brain activity; there is no surgery or invasive process; helps to identify activity in various regions of brain; its use as a diagnostic tool eg epilepsy; lacks precision in measuring individual action potential of neurons / electrodes not sensitive enough, etc.

Q1.

Generally, the outline of ways of studying the brain was accurate and sufficiently detailed, with most students presenting two or even three well described ways of studying the brain. Although most chose to use those named on the specification, other legitimate ways of studying the brain, such as split-brain research, were credited, although the majority of these were poorly focussed.

Overall, evaluation was less successful, with students offering only weak, generic points, for example “it is very expensive”, without any comparison or effective elaboration. However, there were some good comparative discussions regarding other scanning techniques, such as PET scans. Surprisingly, evaluative points often focussed on minor issues, such as consent for post-mortems or lack of movement in fMRI scans, when there are far more important points to consider. Some evaluation was inappropriately focussed on the NHS rather than on scientific research, discussing issues of funding and patient care decisions and/or the benefits of the technique for the patients undergoing them. The lack of specialist terminology was also disappointing. Responses that focused on fMRI studies generally gave a detailed description but often failed to evaluate the core areas of discussion around temporal and spatial issues, and the implications of these in any depth. The majority of answers that focussed on post-mortems were poor, where lengthy accounts were given for why post-mortems may be unethical with weak references to post death consent, alongside some quite humorous and somewhat worrying misunderstandings. Where relevant references were made to the work of Broca and Wernicke, these were not often discussed in enough detail to shape the evaluation convincingly to the question. Overall, students appear to have a superficial understanding of a wide range of techniques and have rote learned a number of advantages and disadvantages of each but lack the deeper understanding to discuss any of these effectively. Schools and colleges should remind students that less is more, as many presented numerous techniques and evaluative points but these lacked elaboration/detail and therefore struggled to move beyond level 2.

Q4.

This was a poorly answered question as many students did not seem to realise that they were required to evaluate the use of EEGs. Answers were often muddled with EEGs being confused and many students seemed to believe that EEGs show precise areas of functioning / cortical specialisation and are an invasive technique. Very few understood that the primary function of an EEG is to indicate whether brain wave activity is rhythmic or not.