1a) **Outline two assumptions of the Biological Approach (4 marks)**

One assumption of the Biological Approach (BA) is that they believe physical structures such as the nervous and endocrine systems and the brain influence our thoughts and behaviour. This is different to the behaviourist approach as behaviourists believe it is nurture (the environment) and the BA believes it is nature (genetics).

Another assumption of the BA is genetics influence behaviour (psychological characteristics). The BA believes faulty genetics can cause illnesses such as schizophrenia and depression, for example schizophrenia is caused by high levels of dopamine, a neurotransmitter in the brain.

1b) **Describe Selye’s General Adaptation Syndrome (8 marks)**

Selye’s General Adaptation Syndrome (GAS) is a syndrome which explains the body’s ability to cope with a particular stressor. ‘Stress’ refers to the psychological and physiological responses which occur when we perceive a threat and don’t have the resources to cope with it. These threats are known as ‘stressors’.

There are three stages: the alarm reaction, the resistance stage and the exhaustion stage.

The alarm reaction stage is where the autonomic nervous system is activated, triggering the ‘fight or flight’ response. Dilated pupils, saliva inhibition and faster heartbeat are examples of what happens to the body during this stage to enable us to prepare for action, whether it be to fight or to run away from the threat. The adrenal glands secrete adrenaline, keeping the body alert for a longer period of time.

The resistance stage is where cortisol is released into the blood to keep the body in a higher state of alert if the adrenaline secreted previously isn’t enough. The hypothalamic pituitary adrenocortical axis is used to produce cortisol. The hypothalamus produces corticotrophin releasing factor, making the pituitary release adrenocorticotropic hormone which then stimulates the adrenal cortex to produce cortisol which then circulates through the bloodstream.

The final stage is exhaustion, where the body can no longer cope, as resources have been used up and become depleted. The immune system breaks down and isn’t as effective. High levels of cortisol impair the functioning of the immune system, possibly causing allergic reactions, high blood pressure (hypertension) and asthma, amongst other ailments.
2) Describe how the Biological Approach has been applied to either Psychosurgery or Chemotherapy (12 marks)

The aim of Chemotherapy is to treat mental disorders such as depression and schizophrenia by interfering with the balance of neurotransmitters in the brain. This links to the assumptions of the biological approach as it suggests faulty genes can lead to abnormal levels of brain chemicals. It also relates to the assumptions in that it is suggested that psychological disorders resemble physical illnesses as they have an underlying physical cause.

Chemotherapy works by either blocking the reuptake of neurotransmitters into the pre-synaptic neuron or blocking the receptors of the post-synaptic neuron in order to decrease/increase neurotransmitter levels and relieve symptoms. Depression is believed to be caused by a lack of serotonin, and schizophrenia by too much dopamine. Drugs which help treat this include SSRIs (Selective Serotonin Reuptake Inhibitors) for depression, which block the reuptake of serotonin, keeping it in the synapse (space between neurons) for longer. Prozac is an antidepressant and is an example of an SSRI. Chlorpromazine treats schizophrenia by blocking receptors from taking in excessive amounts of dopamine, reducing symptoms.

A supporting study is Trivedi et al who did some research into the effect of SSRIs in nearly 3000 outpatients. A third were no longer depressed and almost half reduced symptoms, showing chemotherapy to be quite effective. It is also a fairly inexpensive treatment compared to psychological treatments. However, there can be side effects to chemotherapy, for example the use of SSRIs can cause sexual dysfunction in men and some women, and also increase the risk of self-harm and potentially suicide. Some patients report experiencing withdrawal symptoms after stopping taking SSRIs, suggesting they can be addictive. Another disadvantage to chemotherapy is the use of chlorpromazine (which treats schizophrenia) causing dopamine levels to go too low and causing symptoms of Parkinson’s disease e.g. severe tremors and a shuffling gait. Drugs do not actually cure mental illness but do relieve symptoms, so the drugs often have to be taken for long periods of time to have an effect.

3a) Evaluate two strengths of the Biological Approach (6 marks)

One strength of the Biological Approach (BA) is the practical application of Chemotherapy. It helps to treat people with mental disorders such as depression and schizophrenia and reduce their symptoms. It works by drugs (e.g. Prozac, an SSRI) being taken and affecting the balance of brain chemicals (neurotransmitters), changing behaviour and hopefully improving and reducing symptoms of mental disorders. A supporting study is Trivedi et al who reported 33% of patients were no longer depressed and 47% reduced the severity of symptoms.

Another strength of the BA is the methodology of scientific methods such as fMRI, MRI scans and twin studies. McGuffin et al conducted research into monozygotic (identical) and dizygotic (non-identical) twins and found out monozygotic twins were more likely to develop mental disorders such as depression – they had a higher concordance rate – than dizygotic twins. This shows that there is a moderate genetic link, and it is a strength of the approach because it shows using scientific methods how genetics play a part in a person’s mind and behaviour.
3b) **Evaluate two weaknesses of the Biological Approach (6 marks)**

One weakness of the Biological Approach (BA) is the methodology of scientific methods. They lack ecological validity, meaning they are not true to life, as they are conducted in a controlled environment so that any extraneous variables do not affect the results. One example is Kansaku et al who did an experiment into which side of the brain language is based in males and females. They read a story to them while the patients were inside an MRI scanner, which isn’t like everyday life, making it lack ecological validity. There is also a long wait for scanners as doctors have priority over psychologists, so research could take a long time.

Another weakness of the BA is it is reductionist – it over-simplifies human behaviour to genetics, and nothing else. Only experiments are done which explore genetics and links between brain chemical balances and mental disorders, not emotions and past experiences, like the Psychodynamic approach, for example.

5) **Explain and Evaluate the methodology used by the Biological Approach (12 marks)**

The biological approach is very scientific and uses brain scanning techniques such as MRI and fMRI scans and twin studies. MRI and fMRI scans are used for observing brain activity. MRI (Magnetic Resonance Imaging) scans work by placing a person’s head in a powerful magnetic field, causing particles in the brain to ‘line up’. Radio waves are then bounced off, and computer software interprets this as a cross-section of the brain. fMRI (Functional Magnetic Resonance Imaging) scans show where the most oxygen is in the brain. This shows where the most activity is as more oxygen is needed in areas being used. Four images a second are produced. One study is Kansaku et al (2000), who aimed to test which side of the brain men and women used when they were being read a story to see where language is processed in the brain. Women had activity on both sides, whereas men only had it on the left side.

One advantage of brain scans is living brains can be studied as you don’t need to wait until post-mortem to examine the brain. Another is very detailed images are produced and are very objective so results cannot be biased. One disadvantage is that doctors take precedence over psychologists to get to the scanning machines, so studies can take a long time, and they are very expensive and experiments done while in a scanner lack ecological validity as it is out of the ordinary to be placed in those conditions.

Another method used by Biological psychologists is twin studies where monozygotic (identical) twins and dizygotic (non-identical) twins are studied to see if the identical twins have a higher concordance rate (likelihood of inheriting mental disorders) or a lower rate than non-identical twins. It helps psychologists establish whether nature (genetics) or nurture (environment) affects behaviour as twins from different environments can be studied as well. One case is McGuffin et al where over 200 pairs of twins were studied. Monozygotic twins had a 46% concordance rate compared to just 20% of dizygotic twins, demonstrating a moderate genetic influence on development of depression.

Similarities in monozygotic twins’ behaviour can be easily attributed to genes but there have been cases where dizygotic twins have been wrongly labelled as monozygotic twins. Perhaps monozygotic twins cannot be attributed to common genes because of the similar environments they grow up in. Twin studies need to be interpreted with caution. No studies have had 100% concordance rates, so the environment must have an influence.