Question Number	Correct Answer	Mark
1(a)	1. idea that enzymes are proteins ; 2. reference to transcription ; 3. gene / eq ; 4. reference to mRNA ; 5. reference to translation (of mRNA) ; 6. reference to genetic code / eq ; 7. reference to {ribosome / polysomes} ; 8. reference to tRNA ; 9. idea that amino acids bonded / polypeptide produced ;	**max (4)**

Question Number	Correct Answer	Mark
1(b)	1. adrenoceptors are {proteins / glycoproteins} ; 2. phospholipids can move in the membrane / eq ; 3. can be {added to / removed from / move around in} {phospholipid bilayer / membrane} ; 4. adrenroceptors can interact with phospholipids e.g. {hydrophobic / hydrophilic} interactions ;	**max (2)**

Question Number	Correct Answer	Mark
1(c)	1. {incomplete / insufficient} data / eq ; 2. different interpretations of data / eq ; 3. & 4. credit any two examples from the text e.g. evidence from noradrenaline, electrical stimulation, multifactorial problem, antidepressant drugs, pain killers, gender ;;	**max (3)**

Question Number	Correct Answer	Mark
***1(d)(i)**	(QWC – Spelling of technical terms *(shown in italics)* must be correct and the answer must be organised in a logical sequence) **Drug therapy** 1. idea that it affects the whole brain ; 2. idea that it is difficult to get dose right ; **DBS (Deep Brain Stimulation)** 3. targets specific area of the brain / eq ; 4. relieves tremors /eq ; 5. has effects on {other areas of the brain / other cell types} ; 6. has short term side effects e.g. laughing, crying ; 7. has long term side effects e.g. depression, mood swings, suicidal tendencies ; 8. invasive procedure has risk / eq ; **Gene therapy** 9. corrects chemical imbalance / eq ; 10. precise group of cells affected / eq ; **Light therapy** 11. very precise effects / eq ; 12. requires genetic modification / eq ; 13. genes from different species / eq ; **General** (Gene or light therapy) 14. dangers of using virus as vector / eq ; 15. ethical issues of genetic modification / eq ;	**max (7)**

Question Number	Correct Answer	Mark
1(d)(ii)	1. both caused by {lack / eq} of neurotransmitter ; 2. Parkinson's {lack / eq} of dopamine ; 3. depression {lack / eq} of serotonin ;	**max (2)**

Question Number	Correct Answer	Mark
1(e)	1. light affects pigments / eq ; 2. rhodopsin / iodopsin (in mammals) ; 3. (changes in pigment) result in action potentials /nerve impulses / eq ; 4. pigments (in cones) respond to {specific / eq} wavelength / eq ;	**max (3)**

Question Number	Correct Answer	Mark
1(f)	1. virus acts as a vector ; 2. reference to human cold virus ; 3. virus has specific surface proteins / eq ; 4. match surface{proteins / receptors / eq} of target cell ; 5. binding to surface protein promotes entry to cell / eq ; 6. idea that genes can be incorporated into {host DNA / eq}	**max (3)**

Question Number	Correct Answer	Mark
1(g)	1. {causes / involved in / eq} inflammation / eq ; 2. vasodilation / eq ; 3. increased blood flow / eq ; 4. increased {permeability / leakage} of blood vessels ; 5. Oedema / swelling / eq ; 6. reference to temperature increase ; 7. reference to histamine / mast cells ; 8. idea that phagocytes / macrophages move to site ;	**max (2)**

Question Number	Correct Answer	Mark
1(h)	1. representative sample / eq ; 2. (sufficiently) large sample / eq ; 3. double blind testing ; 4. reference to placebo ; 5. objective measurement of effects / eq ; 6. (collecting / analysing) separate data sets for males and female / eq ; 7. other factors need to be {controlled / measured} e.g. hormone levels in females, socioeconomic, nutrition ; 8. reference to other models e.g. animals, tissue culture ; 9. appropriate comment on safety issues e.g. toxicity ; 10. consideration of time e.g. between dose and observation, long term data ;	**max (4)**

Question Number	Answer	Mark
2(a)(i)	C ;	**(1)**

Question Number	Answer	Mark
2(a)(ii)	A ;	**(1)**

Question Number	Answer	Mark
2(b)(i)	**D** = antigens / (glyco)proteins ; **E** = B {lymphocytes / cells} / plasma cells ; **F** = antibodies / immunoglobulins ; **G** = macrophage / phagocyte / eq ; **H** = enzymes / lysozyme ;	**(5)**

Question Number	Answer	Mark
2(b)(ii)	1. reference to protein nature of {antigens / antibodies} ; 2. antigens are specific (to each bacteria) / eq ; 3. antibodies need to be {complementary / specific} (to the antigen) ; 4. idea that {binding / eq} can take place ; 5. (some bacteria) have {different / changed} antigens / eq ; 6. idea that this is a primary infection ; 7. reference to {mucus / slime} {coat /capsule} (of bacterial cells) ; 8. idea that some bacteria are inside body cells ; 9. idea of antibodies already present e.g. from passive immunity or breast feeding ;	**max (3)**