

Question number	Answer	Marks	Guidance
1 (a) (i)	Actinomyosin	1	
1 (a) (ii)	Summation	1	
1(b) (i)	Between 1.2 and 2.0 μm , tension higher as length longer; non-linear change / described; reference to peak; between 2.2 and 3.6 μm tension lower as length shorter; figures quoted;	4 max	
1(b) (ii)	2.0–2.2; μm ;	2	
1(b) (iii)	<i>As length of sarcomere increases</i> overlap decreases between actin and myosin; fewer cross bridges form during contraction; reduced power stroke; <i>as length of sarcomere decreases</i> reduced, movement / sliding, of filaments; reduced contraction of muscle;	5	
2 (a) (i)	Myelin sheath	1	
2 (a) (ii)	Reduced speed of impulse transmission; loss of insulation along neurone; <i>idea that</i> sodium ions can diffuse (into axon or dendron) at points other than Nodes of Ranvier; shorter local circuits;	4	
2 (b)	Damage to sensory neurones affects vision and sensation in limbs; damage to motor neurones effects muscle contraction; (so) muscles of bladder and digestive system; damage to neurones present in central nervous system effect balance and co-ordination;	4	
3 (a) (i)	A vesicle (containing neurotransmitter); F neurotransmitter; G pre-synaptic membrane; H post-synaptic membrane;	4	
3 (a) (ii)	Exocytosis	1	
3 (b) (i)	Serotonin would remain bound to receptor (on post-synaptic membrane); repeated action potentials / continual stimulation;	2	
3 (b) (ii)	P is complementary shape to serotonin transporter; P binds to transporter; less / no, serotonin taken into synaptic knob; increased levels of serotonin in synapse;	4	
3 (c)	Cocaine is not selective; levels of, other neurotransmitters / named, increased; more / increased, side effects; e.g., blood pressure;	4	
4 (a)	Reduced blood flow; reduced formation of tissue fluid;	2	
4 (b)	Increases / produces, contrast; more detail visible;	2	
4 (c)	<i>fMRI scan</i> more detail; range of colours; differences in blood flow visible; ORA	3	
4 (d)	<i>MRI scans advantages</i> more detail of soft tissue; safer / ionising radiation not used; <i>disadvantages</i> more expensive; take longer; less detail of bones claustrophobia; ORA	4 max	
4 (e)	Treatment has to start quickly; CT scans still provide some detail;	2	