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A2 Biology OCR

Unit F215: Control, genomes and environment

Module 4.2 Animal responses

Answers

1

- a) from below / ventral / AW; **A idea of brain being seen from below**
R upside down, looking upwards 1
- (b) (i) **reject choice of answers, accept any reasonable spelling**
A cerebrum / cerebral hemisphere / cerebral cortex / frontal lobe;
 ignore refs to right or left **R incorrect lobe**
B pituitary (gland); **R hypothalamus**
C cerebellum;
D medulla (oblongata) 4
- (ii) control of breathing;
 control of heart rate;
 control of circulation;
 control of swallowing / salivation / vomiting reflex; 2
- (c) *If blood hormone concentration rises*
 inhibits output of trophic hormones by pituitary gland;
 which inhibits output of hormones by endocrine glands;
 blood hormone concentration falls to normal levels;
 ref. negative feedback;
 ORA max 2

[9]

2

- (calcium ions/ Ca^{2+}) released from sarcoplasmic reticulum;
 bind to troponin;
 troponin changes shape;
 troponin/tropomyosin, moves;
 myosin binding site exposed;
 myosin head binds (to actin); 3 max

[3]

3

- (i) **A cartilage;**
B synovial fluid; 2
- (ii) reduces friction / stops bones rubbing together; **R no friction**
 shock absorber / cushions bone;
 keeps (joint) lubricated / AW;
 (fluid) provides nutrients to, chondrocytes / cartilage; **A cells**
 max 3

[5]

4

chimpanzees

arboreal / AW;
 co-ordination of movement more complex / chimps perform more
 complicated tasks / AW; ora
 more neurones required / AW; ora
 AVP; e.g. hand-eye co-ordination

2 max

[2]

5

(i) corpus callosum ;

1

(ii) cerebellum ;
 medulla (oblongata) ;
 hypothalamus ;
 cerebrum / cerebral cortex ;

4

[5]

6

1 ATP produced ;

2 Na⁺ or K⁺ pump / maintains concentration gradient / repolarisation ;*transmission of impulses*

3 acetylcholine / neurotransmitter formation ;

4 vesicle formation ;

5 movement of vesicles ;

6 exocytosis / vesicles fuse with membrane ;

7 ref. active transport (of ACh / Ca²⁺) ;

8 AVP ; e.g. ref to microtubules / endocytosis

4 max

muscular contraction

9 ATP attaches to myosin head / ATPase ;

10 hydrolysis of ATP / ATP → ADP + P ;

11 myosin head tilts / shortening of sarcomere ;

12 ATP / energy, required for detachment of myosin head ;

13 from actin ;

14 calcium pumps in sarcoplasmic reticulum ;

15 synthesis of protein (for repair, growth) ;

16 AVP ;

5 max

8

max

QWC – clear, well-organised using specialist terms ;

1

award the QWC mark if four of the following are used in correct context
 acetylcholine, actin, myosin, sarcoplasmic reticulum, exocytosis,
 hydrolysis, repolarisation

[9]

7

- (a) *cerebellum*
- coordination of, (voluntary) movement / skeletal muscles;
 (control of) posture;
 (control of) balance;
 AVP; max 2
- medulla oblongata*
- initiation / control of, breathing rate;
 control of heart rate; R initiation of heart rate
 control of blood pressure;
 control of peristalsis (in alimentary canal);
 AVP; max 2
- (b) (i) build up of, tau / protein; 1
- (ii) secretion of / high levels of, A β 42 / beta amyloid 42
 / abnormal A β ; R A β 40 1
- (c) similar shape to, acetylcholine / ACh;
 binds to / enters, active site;
 prevents ACh entry;
 competitive (inhibitor);
 different shape to ACh;
 enters / binds, but not at active site;
 allosteric / indirect;
 change in, tertiary structure / shape of active site;
 non-competitive (inhibitor); max 3
- (d) prevents ACh breakdown / increase ACh level;
 ACh binds to, proteins / receptors;
 on post-synaptic membrane;
 depolarisation / action potential / impulse (produced);
 activates memory circuit / AW; max 2
- (e) control group;
 given, placebo / tablet / injection / no drug;
 idea of 'double-blind' trial, i.e. neither patient nor doctor aware of which
 treatment each patient receives;
 random assignment of each patient to one group;
 similar severity of symptoms before trial;
 control of age;
 control of gender;
 control of diet;
 control of drug, dosage / administration;
 not taking any other, drug / medication;
 ref to suitable sample size;
 AVP; max 3

[14]