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PHYSICAL EDUCATION **9396/11**

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MARK SCHEME

Maximum Mark: 90

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Question	Answer	Marks
Section A		
1(a)	4 marks for 4 of: (sub-max. 2) 1 movement created when one muscle contracts AND another muscle relaxes; 2 movements at elbow are flexion AND extension; (sub-max. 2) *during flexion:* 3 biceps brachii acts as agonist / prime mover; 4 (agonist) muscle shortens (under tension); 5 joint angle is reduced / concentric; 6 triceps brachii acts as antagonist; *during extension:* 7 triceps brachii as agonist / prime mover; 8 (agonist) muscle shortens (under tension); 9 joint angle is increased / eccentric; 10 biceps brachii is antagonist;	**4**
1(b)(i)	1 mark for: 1 isokinetic: movement AND isometric: no movement;	**1**
1(b)(ii)	1 mark for: 1 concentric: muscle shortens AND eccentric: muscle lengthens;	**1**
1(c)	5 marks for: 1 concentric / isotonic; 2 flexion; 3 iliopsoas / sartorius / rectus femoris; 4 extension; 5 latissimus dorsi / supraspinatus / subscapularis / infraspinatus / teres minor / pectoralis major / rotator cuff muscles / (posterior) deltoid;	**5**
1(d)(i)	3 marks for: 1 cardiac output: volume of blood leaving the heart / left ventricle per minute; 2 stroke volume: volume of blood leaving the heart / left ventricle per beat; 3 cardiac output = stroke volume x heart rate / Q = SV × HR;	**3**
1(d)(ii)	2 marks for: 1 cardiac output: same / unchanged; 2 stroke volume: increases / larger;	**2**

Question	Answer	Marks
1(d)(iii)	4 marks for any 4 of: 1 during exercise – increased venous return; 2 increased diastolic filling / preload; 3 increased stretch of cardiac muscle / elastic; 4 increased the force of contraction / stronger / more powerful; 5 known as Starling's law; 6 higher percentage of blood ejected from heart per beat / increased ejection fraction; 7 end systolic volume lower than at rest;	**4**
1(e)	3 marks for 3 of: (sub-max. 2 marks) *oxygen:* 1 combines with haemoglobin / forms oxyhaemoglobin; 2 dissolved / eq. in blood plasma; (sub-max. 2 marks) *carbon dioxide:* 3 as bicarbonate / hydrogen carbonate ions / carbonic acid; 4 dissolved / eq. in blood plasma; 5 combined / eq. with plasma proteins / haemoglobin / as carbaminohaemoglobin;	**3**
1(f)(i)	3 marks for any 3 of: *(during exercise)* 1 rate / depth of breathing increases; 2 additional muscles are used; *inspiration:* 3 increases size / volume of the thorax / chest cavity / lungs; 4 helped by sternocleidomastoid / scalenes / pectoralis minor; *expiration:* 5 pull ribcage quickly / powerfully downwards; 6 helped by internal intercostal muscles / rectus abdominus / abdominals;	**3**

Question	Answer	Marks
1(f)(ii)	4 marks for any 4 of: 1 cardiac hypertrophy; 2 bradycardia; 3 less oxygen used by heart – more available to muscles; 4 increased capillary density / more capillaries at alveoli and / or muscle; 5 increased blood flow to lungs / greater pulmonary diffusion gradient; 6 increased number / size / density of mitochondria; 7 increased myoglobin content; 8 increased oxidative enzyme activity; 9 increased glycogen / triglyceride stores; 10 increased maximal minute ventilation; 11 increased arterio-venous oxygen difference / VO_2 max.; 12 increased blood volume / more red blood cells / erythrocytes / haemoglobin; 13 delayed lactate threshold / OBLA;	**4**

Question	Answer	Marks
Section B		
2(a)	4 marks for: *Max. 3 marks if no examples.* 1 open – affected by the environment / needs adapting / closed-loop control / many decisions, e.g. pass in football / netball / basketball / tennis stroke; 2 serial – skill made up of two or more discrete elements / sub-routines readily separated / separate skills involved in whole movement, e.g. a triple jump / a gymnastics routine; 3 complex – many stimuli / lots of information to process / many decisions to make / more feedback / skill with more or many subroutines, e.g. basketball dribble / tennis serve / receiving / delivering a pass in a game; 4 high organisation – sub-routines difficult to separate from whole movement / practised as part of whole movement / large amounts of information to be processed / many decisions to be made quickly, e.g. pole vault / complex gymnastic moves / diving / trampolining skill / discus / hammer throw;	**4**
2(b)(i)	1 mark for: 1 innate / born with / heredity / genetic predisposition to certain activities / skills / tasks;	**1**
2(b)(ii)	2 marks for: 1 (gross motor ability) strength / speed / stamina / agility / power / eq; 2 (psychomotor ability) balance / hand-eye co-ordination / spatial awareness / reaction time / eq.;	**2**
2(c)	4 marks for 4 of: (sub-max. 1 mark) 1 example, high jump made-up of run-up, take-off, flight and landing / eq.; (sub-max. 3 marks) 2 series of sub-routines / set of neural commands; 3 completed in the correct sequence / order; 4 stored in long-term memory; 5 run from short-term memory; 6 effector mechanism / nervous system transfers EMP to muscles; 7 well learnt sub-routines become sub-conscious / relegated for new skill to be developed;	**4**

Question	Answer	Marks
2(d)	6 marks for any 6 of: 1 information stored in long-term memory; 2 generalised series of motor programmes; 3 recall schema; 4 errors in practice are used to learn what not to do; 5 coach manipulates environment so learner experiences variety of situations / varied practice; 6 initial conditions – learner takes into account the environment; 7 response specifications – learner decides what to do / how to perform skill; 8 recognition schema controls the movement; 9 sensory consequences – kinaesthetic / intrinsic feedback / feelings – to judge whether to modify movement / check whether it feels right; 10 response outcomes – use knowledge of results to check whether outcome is effective;	**6**
2(e)	6 marks for 6 of: (sub-max. 2 marks) 1 perceptual mechanisms – interprets / judges / identifies information; 2 perceptual mechanisms involves DCR process; 3 selective attention occurs; (sub-max. 2 marks) 4 translatory mechanisms (decision-making) – chooses / decides action to take; 5 translatory mechanisms (decision-making) – involves STM / LTM; (sub-max. 2 marks) 6 effector mechanisms – selects motor programme; 7 effector mechanisms – stored in LTM / run via STM; 8 effector mechanisms – programs response / relays decisions to muscular system;	**6**
2(f)(i)	3 marks for any 3 of: 1 identify errors; 2 correct / improve / adapt; 3 motivate / encourage / confidence; 4 reinforce effective movements / ensure repetition; 5 control stress / arousal / anxiety; 6 set goals for improvement;	**3**

Question	Answer	Marks
2(f)(ii)	4 marks for: *Max. 2 marks without examples.* 1 knowledge of performance: getting (intrinsic / extrinsic) feedback about an action / movement; 2 e.g. tennis serve technique OR getting information about whether a strategy worked in basketball; 3 knowledge of results: getting feedback from official / coach / crowd about outcome; 4 e.g. points awarded for floor routine OR points scored in basketball;	**4**

Question	Answer	Marks
Section C		
3(a)(i)	4 marks for 4 of: (sub-max. 2 marks for active leisure:) 1 activity done in free time / time away from obligations; 2 for fitness / health benefits; 3 taking part in outdoor activity as a life-time activity; (sub-max. 2 marks for adventure and risk:) 4 outside of comfort zone / unpredictability of natural environment / feelings of challenge / fear of unknown; 5 presence of danger / hazards / perceived or real; 6 beginner – avoid (perceived) risk by careful planning / safety codes / equipment / risk assessments / subjective danger; 7 expert – more risk / objective danger / takes on real risk;	**4**
3(a)(ii)	4 marks for any 4 of: 1 adapted equipment / facilities / developments in technology / inventions; 2 equal opportunities / legislation / inclusion / social acceptance; 3 increased funding; 4 organisations / agencies / campaigns to help disabled; 5 more specialised coaches / helpers / support for disabled; 6 more disabled role models / media coverage of disabled performers; 7 increased understanding / awareness of benefits of activity for the disabled; 8 greater understanding of capabilities of the disabled;	**4**
3(b)(i)	2 marks for any 2 of: 1 refers to performers who have reached excellence; 2 this relates to national and international standards; 3 top of the performance pyramid / few achieve this level; 4 mostly professional / includes able-bodied or disabled;	**2**
3(b)(ii)	5 marks for any 5 of: 1 talent-identification programme / talent spotting / regional scouts; 2 attract funding / sponsorship / media income / TV deals / athlete personal award; 3 high-quality facilities / centres of excellence; 4 support, e.g. sport science / medical / psychological support / physiotherapy / nutritional advice / biomechanics; 5 structured levels of competition; 6 coaching structure / high-quality coaching; 7 structured progression route / development squads / training camps; 8 co-ordinated approach from sporting authorities / whole sport plans; 9 holistic approach / education and career support / athlete career education;	**5**

Question	Answer	Marks
3(c)	6 marks for any 6 of: 1 raise awareness through advertising / publicity / development officers / taster / promotional days; 2 reduce costs for use / make affordable / accessible; 3 develop existing / build facilities in inner city / deprived / rural areas; 4 use sport ambassadors / personalities / role models; 5 more scouts / coaches; 6 focus / target groups; 7 award schemes / extrinsic motivation; 8 modified / adapted sports; 9 improve links within schools / school-club links; 10 follow government guidelines, e.g. best value / equity policies; 11 change attitudes (prejudice / discrimination etc.) within the sport; 12 change structural barriers, e.g. membership restrictions / more clubs / leagues;	**6**
3(d)(i)	5 marks for any 5 of: 1 importance of occasion / match / need to win / win-at-all-costs attitude; 2 media hype / local derby / importance of game; 3 incitement by crowds / opposition / retaliation / coach; 4 referee's decisions; 5 over-arousal of players / use of drugs / high adrenaline / stress; 6 frustration / losing / unable to play well; 7 type of activity – physical contact makes violence more prevalent; 8 use of weapons / cues – (ice) hockey sticks; 9 dehumanisation of players – helmets;	**5**
3(d)(ii)	4 marks for any 4 of: 1 campaigns to promote sportsmanship / fair play awards / educate; 2 better officiating / citing after game / use of technology to help officials / fourth official; 3 rules changed to promote fair play / no tackling from behind / late / high tackles; 4 (on the field) penalties / sin bins / bookings; 5 (off the field) fines / bans; 6 punish the club – deduct points / matches behind closed doors; 7 positive role models / name and shame bad role models; 8 codes of conduct for players / spectators; 9 drug testing; 10 encourage respect for officials / captains only allowed to question decisions;	**4**