

**MARK SCHEME for the October/November 2009 question paper
for the guidance of teachers**

8666 PHYSICAL EDUCATION

8666/01

Paper 1 (Theory), maximum raw mark 100

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 must be read in conjunction with the question papers and the report on the examination.

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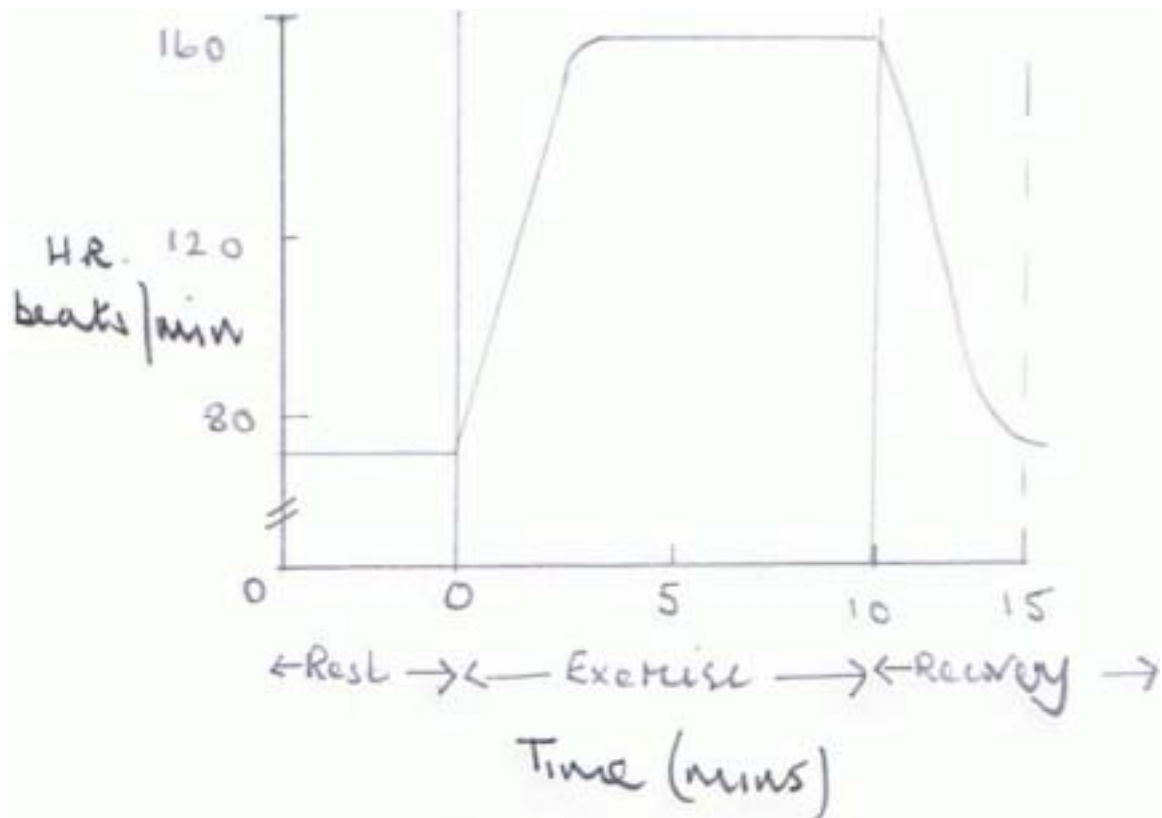
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- 1 (a) (i) 3 marks for 3 of:
 Hip: Flexion
 Knee: Flexion
 Ankle: Dorsi flexion [3]
- (ii) 3 marks for 3 of:
 Hip: Extension
 Knee: Extension
 Ankle: Plantar flexion [3]
- (iii) 3 marks for 3 of:
 Hip: Gluteus maximus
 Knee: Rectus femoris/Vastus Intermedius/Vastus Medialis/Vastus Lateralis/
 Vastus group
 Ankle: Gastrocnemius/Soleus [3]

(b) 4 marks for 4 of:



- 1 Correctly labelled axes
- 2 Resting heart rate/72bpm
- 3(a) Increase prior to exercise/anticipatory rise
- 3(b) Rapid rise at onset of exercise
- 4 Reach plateau/steady state
- 5 Rapid decrease following exercise
- 6 Gradual and more slow decrease towards resting HR [4]

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(c) Sub max 4 marks for 4 of:
(intrinsic factors)

- 1 Temperature increases when exercising/heart muscle gets warmer heart rate increases.
- 2 Conduction of nerve impulses speeds up.
- 3 Temperature decreases leading to a drop in heart rate.
- 4 Conduction of nerve impulses slows down.
- 5 During exercise venous return increases stretching the cardiac muscle.
- 6 Increase in venous return increases heart rate (which increases EDV) and therefore SV (Starling's law).
- 7 This stimulates the SA node increasing heart rate.
- 8 It also increases the force of contraction.

Sub max 2 marks for 2 of:
(hormonal factors)

- 9 Before and during exercise adrenalin is released in the blood stream.
- 10 Adrenalin (stimulates the SA node) to increase HR.
- 11 Adrenalin also increases strength of the ventricular contraction/increases SV. [6]

(d) 6 marks for 6 of

- 1 Respiratory control centre regulates pulmonary ventilation.
- 2 RCC is situated in the medulla oblongata in the brain.
- 3 Respiratory muscles are under involuntary neural control/rate and depth of breathing happens without conscious thought.
- 4 RCC has two areas (inspiratory centre, expiratory centre).
- 5 During exercise (inspiratory centre) stimulates diaphragm/external intercostals.
- 6 During exercise stimulates sternocleidomastoids/scalenes/pectoralis minor.
- 7(a) Therefore increases force and depth of breathing.
- 7(b) During exercise (expiratory centre) stimulates internal intercostals/rectus abdominus/and obliques.
- 8 Therefore causing forced expiration/reducing the duration of inspiration.
- 9 Inspiratory centre immediately stimulates muscles to inspire increasing rate of breathing.
- 10 Increase in CO₂ is detected by chemoreceptors.
- 11 Increase in lactic acid is detected by chemoreceptors.
- 12 Increase in movement is detected by the proprioceptors.
- 13 Impulses sent from inspiratory centre to respiratory muscles via phrenic nerve. [6]

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- 2 (a) (i) Sub max 2 marks for
1 Humerus
2 Radius and Ulna [2]
- (ii) Sub max 1 mark for
3 Hinge joint [1]
- (iii) Sub max 2 mark for
4 head of the ulna is the olecranon process
5 on extension protuberance (olecranon process) rests against humerus preventing hyper extension/accept description [2]
- (iv) Sub max 2 marks for
6 (agonist) Triceps brachii
7 (antagonist) Biceps brachii [2]
- (v) Sub max 1 mark for
8 (agonist) – concentric contraction [1]
- (b) (i) Sub max 1 marks for examples
1 shot put
2 javelin throw
3 sprint canoeist
4 squash player
5 tennis player
(or any sports player requiring speed/power activities of the arm) [1]
- (ii) Sub max 3 marks for 3 of
(must relate to examples)
6 large amount of force/strength/power
7 short time for action/fast contraction speed
8 anaerobic activity/does not require O₂
9 fatigues quickly/time for recovery [3]

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- (c) (i) 4 marks for 2 of:
list not acceptable/must name and have description
- 1 Pocket valves/which prevent back flow
 - 2 Muscle pump/contracting and relaxing of muscles squeezes veins situated between them.
 - 3 Respiratory pump/during exercise breathing deeper/faster, increases pressure in abdomen squeezing large veins in that area/forces blood back to heart.
 - 4 Smooth muscle/in wall of veins contracts and relaxes pushing blood towards heart.
 - 5 Gravity/aids blood to return from upper body and head to heart. [4]
- (ii) 3 marks for 3 of
- 6 Venous return determines end diastolic volume/amounts of blood in ventricles larger.
 - 7 Stroke volume dependent on venous return/Starlings Law – SV dependent on venous return.
 - 8 If venous return increases so does SV.
 - 9 If venous return increases so does Q.
 - 10 Venous return maintains blood pressure.
 - 11 The more blood returned the more can be oxygenated/or opposite. [3]
- (d) (i) 3 marks for 3 of
- 1 Partial pressure of O_2 in alveoli is high compared to deoxygenated blood flowing into alveoli from pulmonary artery.
 - 2 (Difference between the two pressures) is called the (known as) diffusion/concentration gradient.
 - 3 Oxygen diffuses from an area of high pressure to an area of low pressure/down the gradient.
 - 4 O_2 diffuses into haemoglobin (in RBCs) to become oxyhaemoglobin. [3]
- (ii) 3 marks for 3 of:
- 5 High partial pressure of O_2 in blood arriving at muscle cell.
 - 6 Low partial pressure of O_2 in muscle cells.
 - 7 O_2 dissociates from HbO_2 /diffuses into myoglobin in muscle cell.
 - 8 Myoglobin has higher affinity for O_2 than HbO_2 .
 - 9 Myoglobin transports O_2 to mitochondria of muscle cell for aerobic respiration to take place. [3]

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- 3 (a) (i)** 3 marks for 3 of:
- 1 Level of control performer has over timing of the movement/self paced full control.
 - 2 Continuum ranges from performer having full control of the timing of the movement.
 - 3 To the environment having control of the timing of the movement/externally paced no control.
 - 4 Usually used in conjunction with open-closed continuum. [3]
- (ii)** 2 marks for 2 of: sub max 1 for e.g.
- 1 e.g. tennis serve, high jump, javelin throw
 - 2 Performer controls when movement is started.
 - 3 Performer controls rate at which skill is performed. [2]
- (b)** 8 marks for 8 of
- (input)
- 1 fielder receives all information from environment/trajectory/speed of ball/crowd/noise/sunshine
- (sense organs)
- 2 eyes receive all information, send to brain
- (perceptual mechanism)
- Sub max 1 mark for:
- 3 selectively attend to speed/trajectory of ball
 - 4 information interpreted by brain/used to make a decision/refer to memory
 - 5 formation of motor plan/programme
- (effector mechanism)
- 6 impulses/motor programme sent to muscles
- (muscular system)
- 7 muscles work to carry out motor programme/move into position/hands ready to catch
- (response)
- 8 action of catching carried out
- (intrinsic feedback)
- 9 kinaesthetic feedback/catch feels good or bad
- (extrinsic feedback)
- 10 fielder sees result/coach/crowd applaud/batsman walking [8]

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(c) 6 marks total

Sub max 2 marks for each of 3 strategies

- 1 **rehearsal/practice**
- 2 until skill is overlearned
- 3 so that skill becomes automatic
- 4 **association/linking**
- 5 link new information to that already known
- 6 link fundamental motor skills to sports specific skills
- 7 link parts of a serial skill
- 8 all information should be given **simply**/brief
- 9 similar skills/information should be given separately
- 10 information should be **meaningful**
- 11 information needs to be relevant to learner
- 12 **chunking** or grouping of information allows more information to be dealt with
- 13 information is grouped to learn as a whole
- 14 information can be better remembered by having a mental picture/**imagery**/visualisation
- 15 demonstrations create this picture
- 16 teacher needs to present information in a **unique** way/fun/interesting
- 17 as a teacher – do something different
- 18 retrieval and practice

[6]

(d) 6 marks for 6 of:

- 1 Extrinsic is best for beginners as intrinsic may not be recognised by them.
- 2 Extrinsic is feedback from teachers/coaches/parents.
- 3 Teach beginner to recognise the feel of the movement/begin to use intrinsic.
- 4 Positive feedback will reinforce learning for the beginner.
- 5 Good for motivation/encouragement for beginner.
- 6 Good actions are reinforced/SR bond strengthened.
- 7 (Some) negative needed to make movement successful next time/bad habits prevented.
- 8 Terminal is good for beginner/does not have to wait.
- 9 Concurrent not appropriate/attention of beginner in cognitive phase on action.
- 10 Given in manageable amounts.
- 11 Needs to be easy to understand.
- 12 Knowledge of results.

[6]

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- 4 (a) (i)** (skill)
Sub max 2 marks for:
- 4 Efficient/appears effortless/
 - 5 Fluent/well coordinated/controlled
 - 6 Aesthetic/good to look at
 - 7 Goal directed/achieves a set result
 - 8 Follows a technical model
- [2]
- (ii)** (ability)
Sub max 2 marks for:
- 1 Genetically determined/innate/born with/inherited
 - 2 Enduring/lasting
 - 3 Enhanced though childhood experiences
- [2]
- (iii)** (links)
Sub max 2 marks for:
- 9 Abilities are underlying factors essential for the learning of skill/under pin skills.
 - 10 Ability is not learned, skill is learned.
 - 11 Abilities determine learning and performance of skills.
- [2]
- (b)** 4 marks for 4 of:
- 1 Earliest phase/beginner
 - 2 Performer understands what has to be done/thinks about skill
 - 3 Trial and error learning
 - 4 Movements may be successful or fail
 - 5 Use of demonstration by teacher/coach
 - 6 Build up mental picture/mental rehearsal
 - 7 Reinforcement important
 - 8 Movement lacks fluidity
 - 9 Extrinsic feedback/can't rely on intrinsic feedback
- [4]

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(c) schema theory

(i) Sub max 1 mark for:

(knowledge of initial conditions)

5 where is the activity taking place/rounders has been played on a similar surface

Sub max 1 mark for:

(knowledge of response specification)

6 Child has forehand hitting programme from rounders/knows how to swing the racket/
similar to rounders

Sub max 1 mark for:

(knowledge of sensory consequences)

7 Knowledge of how hard to hit the tennis ball/kinaesthetic sense/

Sub max 1 mark for:

(knowledge of outcome)

8 What has happened when child has hit tennis ball/over the net, in court/successful
forehand? [4]

(ii) Sub max 2 marks for:

1 Schema a build up of experiences.

2 Experiences/motor plans can be adapted to meet new situation.

3 Process called transfer.

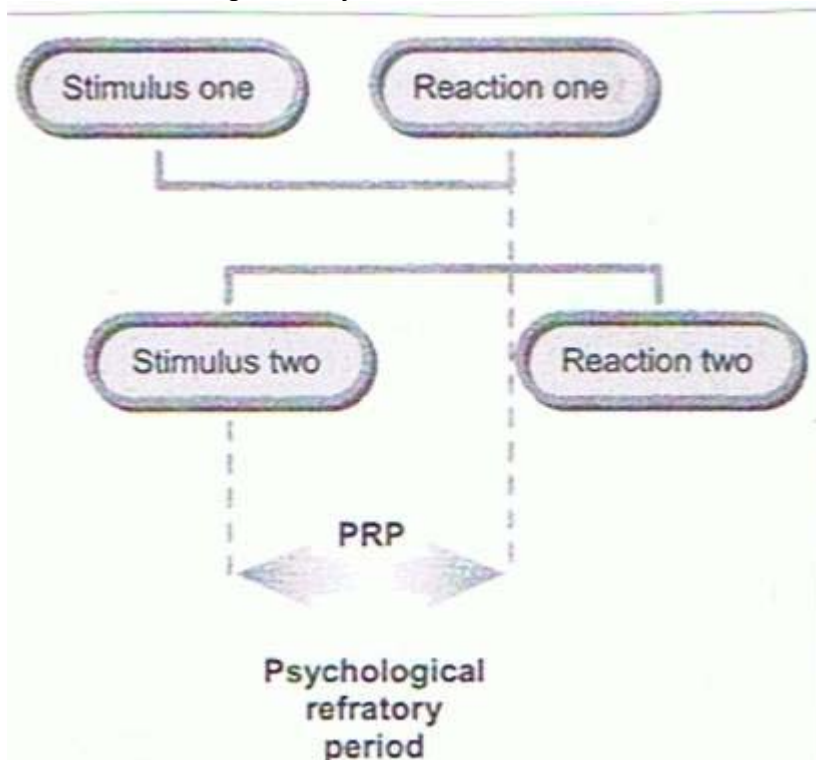
4 Experiences/motor plans are stored in LTM as generalised movements. [2]

(d) (definition PRP)

Sub max 3 marks for 3 of:

1 When processing information from stimulus 1, second stimulus arrives, cannot process
second stimulus until finished processing first one.

One mark for diagram only



2 Delay in processing information from second stimulus increases reaction time.

3 Single channel hypothesis/can only process one piece of information at any one time.

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Sub max 2 marks for 2 of:

- 4 "Selling a dummy" to delay an opponent in order to dodge past e.g. rugby, football, netball, hockey.
- 5 Player makes movement in one direction, sending opponent that way. Sudden change of direction by player means opponent has to complete first move prior to changing direction. Delay by opponent gives player time.
- 6 Delays reaction time

[5]

(e) Sub max 1 mark for:
(definition)

- 1 Process which increases the probability of behaviour occurring.

Sub max 3 marks for:

(importance)

- 2 Ensures that correct actions are repeated.
- 3 Strengthens the S-R bond/response is accompanied by a satisfier.
- 4 Negative reinforcement ensures that incorrect actions are not repeated.
- 5 Strengthens S-R bond/response is accompanied by an annoyer.
- 6 Pleasant outcomes motivate the performer to repeat actions.

[4]

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5 (a) Must relate to football

(i) (play)

Sub max 2 marks for 2 of:

- 1 (who) children and adults
- 2 (when) playtime at school/lunch break at work
- 3 (where) any space in playground/yard
- 4 (why) enjoyment/non-serious
- 5 (how) no rules/unstructured

[2]

(ii) (physical education)

Sub max 2 marks for 2 of:

- 6 (who) all school children/college students
- 7 (when) in curriculum/compulsory
- 8 (where) designated sports area
- 9 (why) learn skills
- 10 (how) in organised lesson

[2]

(iii) (physical recreation)

Sub max 2 marks for 2 of:

- 11 (who) all/have a choice
- 12 (when) no fixed time/any time
- 13 (where) local recreation area/neighbourhood
- 14 (why) fitness/social
- 15 (how) flexible rules/flexible area

[2]

(iv) (sport)

Sub max 2 marks for 2 of:

- 16 (who) professionals/elite performers/those who wish to excel
- 17 (when) designated time
- 18 (where) football pitch
- 19 (why) win
- 20 (how) highly organised

[2]

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- (b) (i)** (foundation)
- 1 school children taught fundamental motor skills, rules/variety of sporting activities to establish ability, skill, interest
(participation)
 - 2 recreative level/regular participation/fun, enjoyment, friends
(performance)
 - 3 commitment to coaching and training/formal competition
(excellence)
 - 4 national/international representation/elite groups/sport science support/funding/high level of coaching [4]

- (ii)** 5 marks for 5 of:
- 1 provision of facilities/equipment
 - 2 provision of organisation/leagues/schemes
 - 3 provision of funding/sponsorship
 - 4 talent identification at foundation level
 - 5 support for clubs
 - 6 advertising/educating
 - 7 school/club links
 - 8 coaching courses
 - 9 target all areas of society
 - 10 role models/media
 - 11 make access safe
 - 12 education/PE [5]

- (c)** 4 marks for 4 of:
- 1 shop window effect/political success
 - 2 sporting recognition attracts financial support/economic progress
 - 3 cultural identity/respect from other countries/pride
 - 4 tourism
 - 5 stability/social control/reduce internal conflict/divert from problems
 - 6 brings groups together/common goal/aspiration
 - 7 improves health of the nation/healthy workforce
 - 8 deflects from undesirable behaviour
 - 9 good athletes often employed by army/police
 - 10 can increase mass participation
 - 11 justify money spent on preparation [4]

- (d)** 4 marks for 4 of:
- 1 build muscle
 - 2 train harder/speed up recovery
 - 3 increase energy/increase O₂ transport
 - 4 mask injury
 - 5 pressure from coaches/peers/sponsors
 - 6 money/win at all costs
 - 7 fear of not winning
 - 8 every body else does it
 - 9 steady nerves
 - 10 increase aggression
 - 11 increase motivation
 - 12 decrease their reaction time [4]

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- 6 (a) (i)** Sub max 3 marks for 3 of:
- 1 personal challenge
 - 2 understanding/appreciating nature
 - 3 respect for the countryside
 - 4 sense of adventure
 - 5 teamwork
 - 6 dependency on others
 - 7 leadership
- [3]
- (ii)** Sub max 3 marks for 3 of:
- 7 lack of funding
 - 8 lack of suitably qualified staff
 - 9 cost of specialised training for staff
 - 10 distance/time to travel to outdoor facilities
 - 11 concerns for the safety of the children
 - 12 extra time needed within the timetable for the activity
 - 13 no local facility/resource/equipment
- [3]
- (b) (i)** Sub max 3 marks for
- 1 high level of skill/endeavour/
 - 2 commitment to training/practice
 - 3 physically active
 - 4 winners and losers/result important/competitive
 - 5 high levels of organisation/designated place and time
- [3]
- (ii)** Sub max 2 marks for:
(leisure)
- 1 unpaid/amateur
 - 2 done in spare/free time
 - 3 standard of performance not important
 - 4 relieve stress/relaxation/health
 - 5 enjoyment/intrinsic value/socialise
 - 6 should be available to all
 - 7 choose to do it
- Sub max 2 marks for:
(work)
- 7 professional/paid for playing
 - 8 very selective/only take part if a good enough standard
 - 9 time spent to improve standards
 - 10 high standards essential to keep place in team
- [4]

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- (c) (i) Sub max 4 marks for 4 of:
- 1 rivalry between spectators
 - 2 mass culture/lose identity within a crowd/peer group pressure
 - 3 team is losing/playing badly/being aggressive/cheating
 - 4 frustration with referee/poor decisions
 - 5 emotional hype of event/gambled on result
 - 6 alcohol consumption/drugs
 - 7 hooligan element/some go just to cause trouble/organised gangs
 - 8 lack of suitable deterrent/punishments
 - 9 poor terracing/poor spectator division/numbers, crowding of spectators
- [4]
- (ii) Sub max 3 marks for 3 of:
- 10 all seater stadiums/segregation of fans/fences
 - 11 club membership schemes/family tickets/ID cards
 - 12 closed circuit TV/police control
 - 13 pubs close/ban alcohol
 - 14 exclude/ban known trouble makers
 - 15 tougher laws/increased legislation
 - 16 use of the video ref
- [3]
- (d) 5 marks for 5 of:
(elderly or disabled or women)
- 1 (money) lack of money/low pension/no longer earning/cost of taking part
 - 2 (transport) lack of car/public transport poor
 - 3 (fitness/health) physically restricted/poor health
 - 4 (facilities) lack of specialist/adapted facilities/equipment
 - 5 (role models) lack of role models to encourage participation/media
 - 6 (coaches) lack of leaders/specialist coaches
 - 7 (esteem) poor self image/physical activity is for younger/able people/fear
 - 8 (options) unsuitable activities on offer
 - 9 (information) lack of information about what is on offer/no media focus
 - 10 discrimination/stereotype
 - 11 lack of suitable competition
- [5]

[Total: 25]