N20/4/SPEXS/SP3/ENG/TZ0/XX/M

Diploma Programme
Programme du diplôme
Programa del Diploma

Markscheme

November 2020

Sports, exercise and health science

Standard level

Paper 3

14 pages

Subject details: Sports, exercise and health science SL paper 3 markscheme

Mark Allocation

Candidates are required to answer **ALL** questions from two of the options **[2×20 marks]**.
Maximum total = **[40 marks]**.

Markscheme format example:

Question			Answers	Notes	Total
5.	**c**	**ii**	this refers to the timing of the movements ***OR*** the extent to which the performer has control over the timing of the movement; external paced skills are sailing/windsurfing/receiving a serve; internal paced skills are javelin throw/gymnastics routine;		**2 max**

1. Each row in the "Question" column relates to the smallest subpart of the question.

2. The maximum mark for each question subpart is indicated in the "Total" column.

3. Each marking point in the "Answers" column is shown by means of a semi colon (;) at the end of the marking point.

4. A question subpart may have more marking points than the total allows. This will be indicated by "**max**" written after the mark in the "Total" column. The related rubric, if necessary, will be outlined in the "Notes" column.

5. An alternative word is indicated in the "Answers" column by a slash (*/*). Either word can be accepted.

6. An alternative answer is indicated in the "Answers" column by "***OR***". Either answer can be accepted.

7. An alternative markscheme is indicated in the "Answers" column under heading **ALTERNATIVE 1** *etc*. Either alternative can be accepted.

8. Words inside chevrons **« »** in the “Answers” column are not necessary to gain the mark.

9. Words that are underlined are essential for the mark.

10. The order of marking points does not have to be as in the “Answers” column, unless stated otherwise in the “Notes” column.

11. If the candidate’s answer has the same “meaning” or can be clearly interpreted as being of equivalent significance, detail and validity as that in the “Answers” column then award the mark. Where this point is considered to be particularly relevant in a question it is emphasized by ***OWTTE*** (or words to that effect) in the “Notes” column.

12. Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.

13. Occasionally, a part of a question may require an answer that is required for subsequent marking points. If an error is made in the first marking point then it should be penalized. However, if the incorrect answer is used correctly in subsequent marking points then **follow through** marks should be awarded. When marking, indicate this by adding **ECF** (error carried forward) on the script. “ECF acceptable” will be displayed in the “Notes” column.

14. Do **not** penalize candidates for errors in units or significant figures, **unless** it is specifically referred to in the “Notes” column.

Option A — Optimizing physiological performance

Question			Answers	Notes	Total
1.	**a**	**i**	3.1–8.0 <km h^{-1} >;		**1**
		ii	2800–2500; = 300 <m>;	*Accept in different order.* *ECF*	**2**
		iii	running distance in the caffeine condition was significantly greater at 3.1–8.0 / 8.1–13.0 / > 18 km h^{-1}; there was no significant effect at other speeds/0–0.4/0.5–3.0/13.1–18.0km h^{-1};		**2**
	b		*To control for the placebo effect where:* the observed effect can only be attributable to the caffeine drink; to counteract the psychological effects of increased effort due to the perceived use of a caffeine drink;		**2**
	c		improve concentration; improved alertness/improved reaction time; longer time to exhaustion/reduced fatigue; increased energy levels/ metabolism; facilities lipolysis / inhibits glycogenolysis; increased strength / facilitates motor unit recruitment; increases in calcium permeability of the sarcoplasmic reticulum; benefits experienced in low to moderate dosage;		**3**

Question			Answers	Notes	Total
2.	**a**		overtraining is when an athlete tries to do more than he or she can physically or mentally tolerate and has negative symptoms whereas overreaching is placing stress on the body that is beyond the athlete's current limit of tolerance <short term> / transient overtraining;		**1**
	b		continuous form of training / run; combination of interval and continuous training, not regimented <intensity, duration, rest>, regulated on how you feel; varying pace / terrain; slower pace used to recover in time for next burst of speed / hill / higher intensity work;		**2**
	c		lasts for a period covering weeks or months; requires overload/increase in intensity; comprises microcycles / constitutes macrocycles; may be transition, preparation, competition;		**2**
3.	**a**		perform training sessions in similar conditions / desert >5 days prior to race; use an environmental chamber; initially reduce intensity of training;		**2**
	b		increased plasma volume as a response to increased stroke volume; lower rest and exercise core body temperature; increased sweat response, as sweat becomes more diluted; reduced rate of muscle glycogen, as cardiac output increases;		**3**

Option B — Psychology of sports

Question			Answers	Notes	Total
4.	**a**	**i**	10;		**1**
		ii	9 – 4; = 5;	*Accept in different order.*	**2**
		iii	the self-talk group reported significantly lower RPE in the post-trial than the pretrial <at 300 s>; the self-talk group significantly improved their mean time to exhaustion post-trial; there was no effect for RPE / time to exhaustion in the control group;	*No data compares RPE between control and self-talk groups*	**2**
	b		thought stopping: inhibiting negative thoughts, perhaps through visualisation; positive self-talk: identifying key words or phrases to help concentration / motivation / reduce anxiety; cognitive reframing: replacing negative thoughts with positive ones;		**2**
	c		perceived to be for problem athletes only, therefore not used for successful athletes; perceived to be a quick fix, but requires significant training time to work effectively; perceived to only relate to elite athletes, when recreational and junior athletes can also benefit; focus on performance often neglects wellbeing;	*Award max **[1]** for list*	**3**

Question			Answers	Notes	Total
5.	**a**		trait anxiety refers to the general level of stress an individual experiences whereas state anxiety refers to a response to a specific situation;		**1**
	b		*Appropriate examples include:* pounding heart; increased sweating / sweaty palms; dry throat/mouth; shakes; butterflies in stomach;		**2**
5.	**c**		*Strengths:* easy to conduct; cheap; relatively valid assessment; *Limitations:* relies on self-report / susceptible to response bias; requires complex knowledge to correctly interpret; cannot provide instantaneous measurement;	*Award max **[1]** for strengths.* *Award max **[1]** for limitations.*	**2**

Question			Answers	Notes	Total
6.	**a**		an individual believes they are not capable of succeeding and therefore does not try or gives up; an individual believes their actions have no effect on the desired outcome/feels doomed to failure; a result of previous attribution of stable factors; a result of previous attribution of uncontrollable factors;		**2**
	b		extrinsic rewards can be seen as controlling; controlling rewards reduce intrinsic motivation; extrinsic rewards can be informational; informational rewards can enhance intrinsic motivation;		**3**

Option C — Physical activity and health

Question			Answers	Notes	Total
7.	**a**	**i**	resistance;		**1**
		ii	(1 + 2 + 2)/3; = 1.67;	*Accept range from 1.60 to 1.70*	**2**
		iii	all forms of exercise had a significant positive effect on general health; aerobic <u>and</u> combined exercise had a significant positive effect on physical functioning; resistance training was the only exercise to resist an increase in bodily pain scores/was the best type of training for reducing bodily pain;	*Award max **[1]** per graph*	**2**
	b		blindness; kidney disease; nerve damage / amputation; cardiovascular disease / amputation;		**2**
	c		*A diet high in saturated fats / sugar* ensure diet is low in saturated fats/sugar/refined foods; *Physical inactivity* sufficient/suggested physical activity/exercise to maintain energy balance / ensure general health; maintain efficient function of the pancreas; *Obesity* ensure appropriate energy balance / adequate calorie intake to avoid becoming obese;	*Ensure each factor is discussed appropriately.* *Award max **[1]** for a list.*	**3**

Question			Answers	Notes	Total
8.	**a**		a state of emotional or affective arousal of varying, not permanent, duration		**1**
	b		chronic/repetitive/stereotyped pattern of regular exercise regardless of any negative consequences; increased priority of exercise; negative mood / irritable with withdrawal; a need to exercise more for the same psychological reward; subjective awareness of compulsion to exercise;		**2**
	c		enjoyable / non-competitive; social environments; involves rhythmic exercise; closed / predictive environments; moderate intensity;		**2**
9.	**a**		*bone density*: increases from birth to the age of 35–45; decreases from then on; age of peak bone density is dependent on gender;		**2**
	b		weight-bearing / resistance training have positive effects on bone density; resistance training results in greater changes than aerobic training; overtraining can cause reduction in bone density; quantity of training that leads to low body weight can cause reduction in bone density ***OR*** lack of exercise can cause reduction in bone density;		**3**

Option D — Nutrition for sports, exercise and health

Question			Answers	Notes	Total
10.	**a**	**i**	bioelectrical impedance analysis;		**1**
		ii	0.74 – 0.30; = 0.44;	*Accept in different order.*	**2**
		iii	urine specific gravity is the most strongly related to urine osmolarity / therefore the most valid; urine colour strongly positively related to urine osmolarity / therefore valid; thirst perception scale only shows a small positive relationship with urine osmolarity / therefore questionable validity; bioelectrical impedance is unrelated to urine osmolarity / therefore not valid;		**2**
	b		basic substance for all metabolic processes in the body; regulates body temperature; enables transport of substances essential for growth; allows for the exchange of nutrients and aids the removal/excretion of metabolic end products;		**2**
	c		electrolyte balance can become a problem when electrolyte levels are too high or too low/balance is disrupted; athletes lose large amounts of water through sweat, which must be replaced; profuse sweating includes loss of sodium/electrolytes; too much water intake can dilute electrolyte balance / hyponatremia; cramping; fewer electrolytes are lost through urine, as urine production declines; dehydration induces ADH, which promotes the retention of sodium;		**3**

Question			Answers	Notes	Total
11.	**a**		storage of bile;		**1**
	b		acts as catalyst; protein digestion; acts in small intestine;		**2**

Question			Answers	Notes	Total
12.	**a**		disorders of bone / calcium homeostasis; disorders of renal function; increased cancer risk <breast, bowel, prostate>; disorders of liver function; increased risk of coronary artery disease;		**2**
	b		high GI foods post competition may assist the body in restoring glycogen stores more rapidly; high GI foods post competition may aid readiness for next training session; low GI foods before competition may be beneficial for slow release of energy during performance; high GI foods immediately pre competition may assist performance;		**2**
	c		*Strengths*: promote/maintain/replenish hydration/electrolyte replacement; promote glucose replacement, therefore increase endurance/maintains exercise intensity; less likely to cause palpitations than caffeine drinks; *Limitations*: long-term overconsumption can cause energy imbalance; can cause nausea/vomiting;	*Award max **[2]** for strengths*	**3**