

國立體育學院九十六學年度研究所碩士班入學考試試題

運動生理學 (運動科學研究所)

(本試題共一頁)

- ※注意：1 答案一律寫在答案卷上，否則不予計分。
2 請核對試卷、准考證號碼與座位號碼三者是否相符。
3 試卷「彌封處」不得污損、破壞。
4 行動電話或呼叫器等通訊器材不得隨身攜帶，並且關機。
5 答案必須橫寫，可用中文或英文書寫。

(總分 200 分)

- (1) 依據關節拉角 (angle of pull) 與主作用肌張力(primary mover tension) 的關係，圖解說明傳統稱作等張收縮運動 (isotonic contraction exercise) 應改稱為等負重收縮運動 (isoload contraction exercise)。 (40%)
- (2) 說明決定最大攝氧率的生理生化因素 (30%)。限制耐力運動員最大攝氧率的因素與限制一般人最大攝氧率的因素有何不同 (20%)。
- (3) 解釋無氧閾 (anaerobic threshold) 概念 (20%)，如何測量無氧閾 (20%)? 為何耐力選手必須俱備有高的無氧閾 (20%)
- (4) Answer the following questions based on the abstract of a study provided.
 - (A) Finish the conclusion of this study (25%)
 - (B) How do you apply the information obtained from this study? (25%)

Purpose: To examine the effect of progressive resistance training on muscle function, functional performance, balance, body composition, and muscle thickness in men receiving androgen deprivation for prostate cancer.

Methods: Ten men aged 59-82 yr on androgen deprivation for localized prostate cancer undertook progressive resistance training for 20 wk at 6- to 12-repetition maximum (RM) for 12 upper- and lower-body exercises in a university exercise rehabilitation clinic. Outcome measures included muscle strength and muscle endurance for the upper and lower body, functional performance (repeated chair rise, usual and fast 6-m walk, 6-m backwards walk, stair climb, and 400-m walk time), and balance by sensory organization test. Body composition was measured by dual-energy x-ray absorptiometry and muscle thickness at four anatomical sites by B-mode ultrasound. Blood samples were assessed for prostate specific antigen (PSA), testosterone, growth hormone (GH), cortisol, and hemoglobin.

Results: Muscle strength (chest press, 40.5%; seated row, 41.9%; leg press, 96.3%; $P < 0.001$) and muscle endurance (chest press, 114.9%; leg press, 167.1%; $P < 0.001$) increased significantly after training. Significant improvement ($P < 0.05$) occurred in the 6-m usual walk (14.1%), 6-m backwards walk (22.3%), chair rise (26.8%), stair climbing (10.4%), 400-m walk (7.4%), and balance (7.8%). Muscle thickness increased ($P < 0.05$) by 15.7% at the quadriceps site. Whole-body lean mass was preserved with no change in fat mass. There were no significant changes in PSA, testosterone, GH, cortisol, or hemoglobin.

Conclusions: