

國立體育大學九十九學年度教練研究所博士班入學考試試題
生物力學組

運動生物力學

(本試題共 1 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。

【本試題總計 100 分】

解釋名詞 (definition and formula)：40 分 (每題 8 分)

1. Moment of inertia
2. Principal axes:
3. Couple force
4. Coefficient of restitution
5. Radial acceleration:

簡答題：60 分

1. Explain how we use central and forward differential method to derive the “instant” velocity (v_4) and acceleration (a_4) from the real data (20 POINTS).

Table 1.

Time(s)	position x(m)	v(velocity)	a(acceleration)
0	x1		
0.01	x2		
0.02	x3		
0.03	x4	v_4	a_4
0.04	x5	v_5	a_5
0.05	x6		
0.06	x7		

2. Please list three forms of resistance contribute to the total drag force and the drag force formula. And explain which one can contribute to propulsion as well and how in swimming (20 POINTS).
3. Explain how we can use inverse dynamics method to derive the knee joint force if we have force plate and motion data. Explain could we derive the elbow joint force without the force plate (20 POINTS).