

系 級	科 目	授 課 教 師	考 試 日 期	學 號	姓 名
醫一	普通物理學	方錫經	91年6月24日第2節		
※①請注意本試題共 <u>1</u> 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。 ②每張試題卷務必填寫(學號)、(姓名)。					

Final Examination on Medical Physics

- Define or Explain the following terms : (24%)
 - respiratory quotient
 - Nernst potential
 - nerve impulse
 - biomagnetism
 - milking
 - photomultiplier
- Explain the characteristics of a computed tomographic scanning.(8%)
- Describe the principles and the medical applications the following bioinstrumentations : (16%)
 - Magnetic resonance imaging(MRI)
 - Ultrasonic imaging
- Answer the following questions : (16%)
 - What are the magnetic field in medical uses?
 - How does the artificial cardiac pacemaker activate in the patient?
- Compare and contrast the following explanations : (16%)
 - The acute effects and chronic effects of radiation in the human body.
 - The mechanisms between the electrocardiography and magneto- cardiography.
- Calculate the Hall Voltage induced on a patient's heart while being scanned by an MRI unit. The conducting path on the heart wall by a wire 7.5 cm long that moves at 10.0 cm/s perpendicular to a 1.50T magnetic field.(8%)
- The ultrasonic transducer has a frequency of 3.5 MHz to scan an oncoming bloodstream, assuming that Doppler frequency shift is $2.0 \times 10^3 \text{ Hz}$, the velocity of ultrasound in the tissues is 1540m/s. If an artery has a diameter of 0.5cm, find the blood flow rate.(12%)

Attention : You may use a calculator but can't use the constant table.