

# 元智大學 107 學年度 碩士班 招生試題卷

系(所)別：電機工程學系碩士班 組別：甲組

科目：醫學工程概論 用紙第 | 頁共 | 頁

●不可使用電子計算機

## Multiple choice: (100%)

1. ( ) Which of the following circuits is commonly used for pressure sensors : (a) Wilson network (b) Neural network (c) Wien bridge (d) Wheatstone bridge (e) All-above.
2. ( ) In computed tomography (CT), CT number refers to the linear attenuation coefficient of which following substance. (a) Air (b) Water (c) Bone (d) Soft tissue (e) Non-above.
3. ( ) The material can not return to its original shape after being stretched by force, which is called : (a) Plastic deformation (b) Elastic deformation (c) Creep (d) Bending deformation (e) Non-above.
4. ( ) Which of the following metals is most suitable for use as a radiation shielding material in medical devices: (a) Tungsten (b) Iron (c) Copper (d) Lead (e) Gold.
5. ( ) Which of the following imaging devices is primarily intended to capture functional images of the human organ: (a) MRI (b) PET (c) Ultrasound (d) X-ray (e) Thermalgraphy.
6. ( ) Which of following controls the X-ray penetration:(a)mA(b)Second(c)kV(d)Distance(e)Non-above.
7. ( ) Which is the most commonly used standards for image interchange in the integration of PACS (Medical Image Acquisition and Transmission System)?(a) HL7 (b) ISO9000 (c) DICOM (d) IEEE488 (e) ISO136485.
8. ( ) The assessment of the risk level of medical instruments should include: (a) Equipment functional category (b) Degree of damage (c) Unexpected historical records (d) All of the above (e) Non-above.
9. ( ) A capacitor with a capacitance value of  $C$ , where  $V$  is the voltage across its end,  $Q$  is the amount of electric charge stored in it, and  $W$  is the energy stored in it, which of the following is true: (a)  $V = CQ$  (b)  $W = 1/2 CV^2$  (c)  $Q = CW$  (d)  $C = CV$  (e)  $C=QV$ .
10. ( ) What elements are required to describe a sinusoidal: (a) Amplitude (b) Frequency (c) Phase angle (d) Above all (e) Non-above.
11. ( ) Which of the following does not have a valve? (a) Lymphatic vessels (b) Heart (c) Venous valves (d) Microvessels (e) Nerve.
12. ( ) An ideal instrumentation amplifier, its input impedance is: (a) 0  $\Omega$  (b) Number of 10 k $\Omega$  (c) Number of 100 k $\Omega$  (d) Number of 1000 k $\Omega$  (e) Infinite
13. ( ) The use of the oscilloscope can observe the AC signal of : (a) Peak voltage (b) Peak to peak voltage (c) Frequency (d) All of the above (e) Non-above.
14. ( ) The use of ultrasound for non-invasive measurements often involves the application of a gel, what is the function of gel:(a) Lubricate (b) Maintain contact (c) Conduct electricity (d) Insulation (e) All-above.
15. ( ) Medical devices susceptible to electromagnetic interference are : (a) Electrosurgical Unit (b) Radio-frequency diathermy (c) Dental high-speed drill (d) Heater (e) All-above.
16. ( ) The energy of muscle contraction comes most directly from : (a) Creatine phosphate (b) ATP (c) Anaerobic respiration (d) Aerobic respiration (e) Non-above.
17. ( ) Which of the following is the ideal conditions for artificial blood vessels ? (a) Easy access (b) Compliance (c) Good biocompatibility (d) All-above.
18. ( ) Which of the following non-invasive methods measures the mean arterial pressure (MAP) : (a) Auscultation (b) Oscillometry (c) Tonometry, (d) Ultrasound (e) All-above.
19. ( ) To filter out the noise caused by breathing from the ECG signal should use : (a) High-pass filter (b) Low-pass filter (c) Band-pass filter (d) Band-reject filter (e) All-above.
20. ( ) In the ICU and CCU, the most commonly recorded physiological signals for patients are : (a) ECG (b) EEG (c) Respiratory signals (d) Blood pressure signals (e) Non-above.