

第一部分：50%

一. 請詳細解釋下列名詞 (每題 5 分):

1. Cardiopulmonary resuscitation
2. Hypothalamic-pituitary-adrenal axis
3. Refractory period
4. Rapid eye movement sleep
5. Excitation-contraction coupling
6. Brain death

二. 以運動神經元(motor neuron)為例詳細說明神經傳遞物質(neurotransmitter)如何釋放，如何產生終板電位(end-plate potential)及造成骨骼肌纖維興奮及收縮的作用。(10分)

三. 請就行為(behavior)及腦波(electroencephalogram, EEG)表現情形來描述睡眠-清醒週期(sleep-wakefulness stages)，並說明哪些因素可能會影響睡眠-清醒週期的長短及分布情形。(10分)

第二部分：50%

1. Which (one) of the following statements is incorrect? (2 points)

- A. A synapse is a site where information is transmitted from one cell to another
- B. Neurotransmission across chemical synapses is bidirectional
- C. The synapse between a motoneuron and a muscle fiber is called the neuromuscular junction
- D. Gap junctions are considered as electrical synapses

2. The left heart and the systematic arteries, capillaries, and veins are collectively called the systematic circulation. The left ventricle pumps blood to all organs of the body except? (2 points)

- A. Brain

- B. Lungs
- C. Kidney
- D. Liver

3. Which (one) of the following statements is incorrect: (2 points)

- A. Resistance to blood flow is influenced by the vessel dimensions
- B. Resistance to blood flow is influenced by blood viscosity
- C. Blood is made up of both cells and plasma; and red blood cells provide most of the viscosity of the blood
- D. Blood is made up of both cells and plasma; and plasma provide most of the viscosity of the blood

4. The nerves system is composed of two divisions: the central nervous system (CNS) and peripheral nervous system (PNS). The CNS contains which of the following components? (2 points)

- A. Brain and spinal cord
- B. Motor nerves
- C. Sensory nerves
- D. Sensory receptors

5. There are two mechanisms that increase conduction velocity along a nerve; the first one is Myelinating the nerve fiber and the second one is? (2 points)

- A. Increase the length of the nerve fiber
- B. Increase the size (diameter) of the nerve fiber
- C. Reduce the length of the nerve fiber
- D. Reduce the size (diameter) of the nerve fiber

6. The volume of air breathed in and out of the lungs is called? (2 points)

- A. Residual volume
- B. Inspiratory reserve volume
- C. Expiratory reserve volume
- D. Tidal volume

7. Please rearrange the following events in a sequence as it would happen during a menstrual cycle:

(2 points)

- i. Ovulation
 - ii. Luteal or secretory phase
 - iii. Follicular or proliferative phase
 - iv. Menses
- A. i, ii, iii, iv
 - B. ii, iii, I, iv
 - C. iii, i, ii, iv
 - D. iv, i, ii, iii

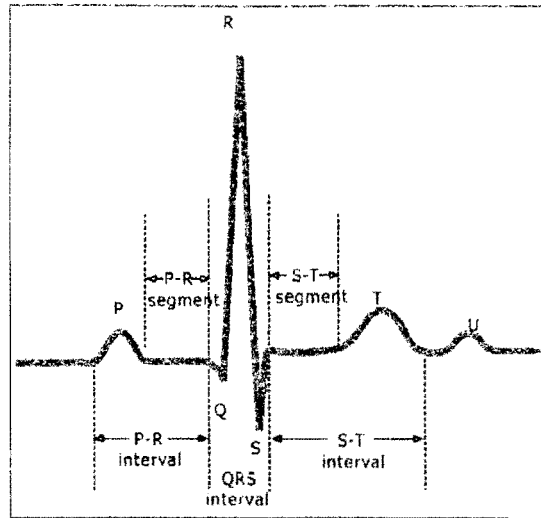
8. Briefly state the differences between the following terms: (10 points)

Isometric muscle contraction vs Isotonic muscle contraction

9. Briefly state the differences between the following terms: (10 points)

Spermatogenesis vs Oogenesis

10. Diagram listed below is a typical electrocardiogram (ECG) recording. Please define the following terms regarding to heart's electrical conduction. (total 16 points)



- A. P wave (8 points)
- B. QRS (or QS) interval (8 points)