**Question 1**

Characteristics of mitochondria are:

Select one:

a. They are intracellular vesicles

b. They are involved in the electron transport chain

c. They have a single cell membrane

d. More dominant in cells which are involved in anaerobic metabolism

Answer B.

**Question 2**

All is true of membrane permeability EXCEPT

Select one:

a. Glucose diffuses rapidly across

b. Charged particles (eg ions) cross slowly

c. CO2 crosses easily

d. Non polar molecules cross easily

Answer A. Ganong 23rd Edition pg 46 "a typical example is glucose transport by the glucose transporter"

**Question 3**

Which of the following statements about the NaK ATPase pump is INCORRECT?

Select one:

a. Its activity is increased by increased concentrations of sodium, thyroid hormones and aldosterone

b. It is a heterodimer with alpha and beta subunits which can act independently

c. Its activity is inhibited by ouabain and related cardiac glycosides

d. It has a coupling ratio of 3:2

Answer B. Ganong 23rd Edition pg 47

**Question 4**

What is the function of the centrioles?

Select one:

a. They control the cilia and flagella

b. To facilitate intracellular communication

c. They are microtubule-organising centres in the spindle formation of the nucleus

d. They form the poles of the mitotic spindle

Answer C. Ganong 23rd Edition pg 37

**Question 5**

Diseases involving receptors include all EXCEPT:

Select one:

a. Hirschsprungs disease

b. Graves disease

c. Systemic lupus erythematosis

d. Myasthenia Gravis

Answer C. Ganong 23rd Edition pg 59 table 2-6

**Question 6**

Regarding intracellular calcium:

Select one:

a. Cyclic AMP is the major secondary messenger releasing calcium from stores

b. There is a marked outwardly directed calcium concentration gradient

c. The free cytoplasmic calcium concentration is 1000 nmol/L

d. Calcium is exchanged for 2 hydrogen ions by a Ca++H+ ATPase pump

Answer D.

**Question 7**

Which of the following statements about chemical second messengers is FALSE?

Select one:

a. cAMP is formed from ATP by the action of adenylyl cyclase

b. Guanylyl cyclases are a family of enzymes that catalyze the formation of cGMP

c. Troponin is the calcium binding protein involved in contraction of skeletal muscle

d. IP3 is the major 2nd messenger that causes entry of extracellular Ca++ into cells

Answer D. Ganong 23rd Edition pg 52 "Causes calcium release from the endoplasmic reticulum"

**Question 8**

Which of the following is not strictly a form of intercellular communication?

Select one:

a. Endocrine communication

b. Neural communication

c. Autocrine communication

d. Paracrine communication

Answer C. Ganong 23rd Edition pg 50

**Question 9**

What is the role of smooth endoplasmic reticulum?

Select one:

a. Acts as an electron transport chain

b. Site of steroid synthesis

c. Lipid synthesis

d. Protein synthesis

Answer B. Ganong 23rd Edition pg 40

**Question 10**

Na+ / K+ ATPase:

Select one:

a. Hydrolyses ADP to ATP

b. Consists of an alpha, beta and gamma subunit

c. Lies on the ECF side of the cell membrane

d. Extrudes 3 Na+ from the cell for every 2 K+ in

Answer D. Ganong 23rd Edition pg 47