

# PHYS121 – Quiz #6

## Code B

Question #1 [1 mark] – The electrical resistance is defined as

- a.  $\frac{V}{I}$   
 b.  $\frac{I}{V}$   
 c.  $V \cdot I$   
 d.  $\frac{I}{V}$

Question #2 [1 mark] – The ratio of the amount of charge transfer (Q) to the potential difference (V) is

- a. Impedance.  
 b. Conductance.  
 c. Electricity.  
 d. Capacitance.

Question #3 [1 mark] – The energy required to separate the electric charges across the membrane is the work done by

- a. Action potential.  
b. Passive potential.  
 c. Sodium and Potassium pumping.  
d. Resting Potential.

Question #4 [1 mark] – The biological cell acts like a

- a. Leaky capacitor.  
b. Strong capacitor.  
c. Leaky resistor.  
d. Strong resistor.

Question #5 [1 mark] – All the following statements describe inactive state of a nerve cell EXCEPT

- a. Resting potential difference.  
 b. The potential difference is positive.  
c. The extracellular fluid is high in sodium ( $\text{Na}^+$ ) and low in potassium ( $\text{K}^+$ ).  
d. The intercellular fluid is high in potassium ( $\text{K}^+$ ) and low in sodium ( $\text{Na}^+$ ).

Q1) Value of resting potential for the heart

- A. 100 mV
- B. 120 mV
- C. -90 mV
- D. -100 mV

Q2) T wave on ECG represent

- A. Depolarization of atria
- B. Depolarization of ventricle
- C. Repolarization of atria
- D. Repolarization of Ventricle

Q3) Ability of capacitor to store charge is

- A. capacitance
- B. resistance
- C. friction
- D. coulomb's force

Q4) Current-voltage graph of ohmic devices is a

- A. linear graph
- B. non-linear graph
- C. parabolic graph
- D. hyperbola graph

Q5) If a current 5A flows through a resistor. Voltage across resistor is 50 V. What is the

- A. 10  $\Omega$
- B. 30  $\Omega$ .
- C. 40  $\Omega$ .
- D. 80  $\Omega$ .

Student-name#

Q1) The pipe then splits up into FIVE pipes, each of which has an area equal to the area just before it splits. What is the speed of the water in each pipe now?

- a)  $V/5$
- b)  $2V$
- c)  $V/4$
- d)  $V/6$

Q2) Fluid A has a flow rate of 95 ml/s. Fluid B has a flow rate of 65.3 ml/s in the same pipe. Compared to fluid A, fluid B is...

- a) more viscous
- b) less viscous
- c) have the same viscosity as A
- d) more dense

Q3) In the flow of water through a capillary tube, if the diameter of the tube is halved, the flow rate will

- a) increase by a factor of 9,
- b) increase by a factor of 27,
- c) decrease by a factor of 16,
- d) Increase by a factor of 81.

Q4) Which has the greatest effect on the flow of fluid through a pipe? That is, in each of the quantities below, which would cause the greatest change in the flow rate?

- a) the fluid viscosity,
- b) the pressure difference,
- c) the radius of the pipe,
- d) the length of the pipe

5) What pressure drop is needed to deliver solution through a needle with a length of 0.05 m at rate of  $10 \times 10^{-5} \text{ m}^3/\text{s}$ , (viscosity of the solution  $\eta = 2.1 \times 10^{-3} \text{ Pa}\cdot\text{s}$ )

- a)  $5.2 \times 10^3 \text{ Pa}$
- b)  $52.24 \text{ Pa}$
- c)  $1.04 \times 10^2 \text{ Pa}$
- d)  $5224 \times 10^{-3} \text{ Pa}$

Q1) Electric charge between two bodies can be produced by

- A. sticking
- B. rubbing
- C. oiling
- D. passing AC current

Q2) Two positive charges  $Q_1 = 20 \text{ C}$  and  $Q_2 = 2 \text{ C}$ , separated by a diameter of 3 m will produce a force of  $K = 9 \times 10^9$ .

- A.  $40 \times 10^9 \text{ N}$
- B.  $60 \times 10^9 \text{ N}$
- C.  $80 \times 10^9 \text{ N}$
- D.  $20 \times 10^9 \text{ N}$

$$= 9 \times 10^9 \frac{20 \times 2}{3^2} =$$

Q3) If we have a positive and a negative charge, then force between them is

- A. positive
- B. negative
- C. zero
- D. infinite

Q4) Ability of capacitor to store charge depends upon

- A. area of plates
- B. distance between plates
- C. type of dielectric used
- D. all of above

Q5) QRS wave on ECG represent

- A. Depolarization of artria
- B. Depolarization of ventricle
- C. Repolarization of artria
- D. Repolarization of Ventricle

## Quiz 5.3 Electricity

heartbeat of less than 60 beats per minute is called

- a. tachycardia
- b. bradycardia
- c. arrhythmia
- d. fibrillation

2. The SI unit of capacitance is

- a. Farad
- b. Ampere
- c. Ohm
- d. Volt

3. To obtain a high value of capacitance, the permittivity of dielectric medium could be:

- a. zero
- b. unity
- c. low
- d. high

4. . Suppose that two point charges, each with a charge of +3.00 Coulomb are separated by a distance of 9.00 meter. Determine the magnitude of the electrical force of repulsion between them, Take  $K = 9.0 \times 10^9$   $N \cdot m^2 / C^2$

- a.  $9.0 \times 10^9$  N
- b.  $9.5 \times 10^8$  N
- c.  $8.5 \times 10^9$  M
- d.  $1 \times 10^9$  N

5. Ability of capacitor to store charge is measured as its

- a. performance
- b. resistance
- c. capacitance
- d. durability

Q1) The pipe then splits up into FIVE pipes, each of which has an area equal to the area just before it splits. What is the speed of the water in each pipe now?

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- c)  $V/4$
- d)  $V/6$

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Student: \_\_\_\_\_  
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- a) more viscous
- b) less viscous
- c) have the same viscosity as A
- d) more dense

Q3) In the flow of water through a capillary tube, if the diameter of the tube is half with no other changes, the flow rate will

- a) increase by a factor of 9,
- b) increase by a factor of 27,
- c) decrease by a factor of 16,
- d) increase by a factor of 81.

Q4) Which has the greatest effect on the flow of fluid through a pipe? That is, if you made a change in each of the quantities below, which would cause the greatest change in the flow rate?

- a) the fluid viscosity,
- b) the pressure difference,
- c) the radius of the pipe,
- d) the length of the pipe

Q5) What pressure drop is needed to deliver solution through a needle with 0.004 m inner radius and 0.05 m length at a flow rate of  $1.0 \times 10^{-5} \text{ m}^3/\text{s}$ . (viscosity of the solution  $\eta = 2.1 \times 10^{-3} \text{ Pa}\cdot\text{s}$ )

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