1) The first passage time (MFPT) is different from settling of a sensor \( t_s \) in the following ways

a) \( t_s \) defines response of a sensor immersed in an infinite media, and MFPT defines the escape of molecules through a finite volume system.

b) The molecules captured by the sensor surface can return to the solution, but molecules exiting the cell volume cannot.

c) \( t_s \) does not depend on the starting point of the molecules, but MFPT does.

d) All of the above.

2) The difference between the FPT and the MFPT is that

a) FTP has a statistical distribution, but MPPT does not.

b) FTP and MFPT are different names of the same physical quantity.

c) FTP depends on the initial position of the molecules, but MFPT does not.

d) Diffusion equivalent capacitance can be used to calculate both MFPT and FPT.

3) The capacitance formula used in calculating the mean first passage time is the

a) Electrostatic capacitance.

b) Transient diffusion capacitance.

c) Steady state diffusion capacitance.

d) None of the above.

4) Assume that a biomolecule is located at a position \( r_0 > 10 a \), where \( a \) is the radius of the exit disk. Which of the following statements is true for the situation?

a) The MFPT is relatively insensitive to the original location of the molecule.

b) The MFPT depends sensitively and inversely with \( r_0 \).

c) The MFPT depends on the cube root of \( r_0 \).

d) The problem is insufficiently specified.
5) Which of the following statement is correct?

a) MFPT, NET, and the sensor response time are all defined by geometry of diffusion.
b) The MFPT and NET define almost similar physical problem, with slight difference.
c) NET is always larger than MFPT.
d) All of the above.

End of quiz. This quiz contains 5 questions.