The questions refer to:

Salehi Kolahi, M., Moeinkhah, H. (2020). 'A theoretical model for analysis of ionic polymer metal composite sensors in fluid environments', Journal of Computational Applied Mechanics, 51(1), pp. 21-29. doi: 10.22059/jcamech.2019.282591.406

1. Describe in your own words what the authors are working to achieve in the paper. (2.5 points)

2. Draw a diagram illustrating the physical scenario and explain in your own words what is happening in this system. (2.5 points)

3. What assumptions are made to obtain the mathematical model? How can you justify those assumptions? (2.5 points)

4. The governing equations are for the problem described are given by Equations (9) and (18). Classify these equations. (2.5 points)

5. How many initial and boundary conditions are needed for each to make a well-posed problem for these two equations? Describe the conditions as given in the paper. (2.5 points)

6. The authors use a Laplace transform as a route to solve this system. Explain how they use the Laplace transform here. Could a Fourier transform be used instead as a method of solution? Why or why not? Describe the similarities and differences between the two transforms. (2.5 points)

7. How do the authors approach reducing the model and make it of "finite order"? How would you justify their approach mathematically (specifically, the number of terms in the reduced model)? (2.5 points)

8. Equation 39 provides the final reduced order structure of the equation in Laplace coordinates. What properties of Laplace transforms would permit allow the solution to be written in the time domain? Provide an equation showing the transformation from equation (39) to the time domain. (2.5 points)

9. The authors compare their solution to both experimental results and to finite element models. What is the utility of using their solution process in comparison to experimental methods and finite element analysis? (5 points)