

Grading Policy for Midterm Exam

1. Problem#1

Expected steps:

We expected students to relate each equation given in the problem to relevant scenario (1D, 2D, 3D) based on solution uploaded. Moreover, brief explanation was expected showing they have understood the concept correctly.

Partial credits:

2 points was assigned to each case. From 2 for each, 1 point was allocated to clearly mentioning the dimension for each scenario (1D, 2D, 3D) and 1 point for explanation.

2. Problem#2

Expected steps:

- a. We expected students to clearly mention the system in any different words. Any type of referring to system such as thin film and/or $z=0$ to $z=L$ was accepted.

Expected steps:

- b. Students were expected to describe the volumetric element clearly or draw it. There were some cases that description was not clear or there was mismatch between description and drawing.

Partial credits:

For first part, any unclear or wrong answer in describing the system resulted in losing of all credits. For part b, unclear answers or mismatch caused full (2) or partial (1) loss of points.

3. Problem#3

Expected steps:

In this problem, all those who referred to equality of fluxes ($J_1 = J_2$), reached to answer by solving it, and finally showed the profiles correctly on figure, could obtain full mark.

Partial credits:

There were some students who only showed the final formula or value for C_i . As a result, they lost part of points since referring to equality of fluxes was considered as key concept in this problem. Also, students who draw the profiles in a wrong way, lost almost 2 points.

4. Problem#4

a.

Expected steps:

All those who showed the corresponding formula describing concentration profile and calculated infinite flux at $z=0$, obtained full mark.

Partial credits:

Showing the formula with wrong final answer for flux caused partial losing of the points.

b.

Expected steps:

All those who calculated the ratio of fluxes in anyway ($J(1,0)/J(1,1)$ or $J(1,1)/J(1,0)$) using the formula was shown in part a, obtained the full mark.

Partial credits:

Wrong values for ratio or parametric answers (without final values) lost part of points depending on whole answer.

c.

Expected steps:

It was expected student to mention clearly the **integration** of the flux between **0 to 10 (s)** at **$z=0$** .

Partial credits:

Missing each of one the key points highlighted resulted in partially losing of the points.

5. Problem#5

Expected steps:

Due to nature of the problem, everybody that showed $n=cv$ for each component, approached to problem by summing of them and related concentration of each component to total concentration, obtained full mark.

6. Problem#6

Expected steps:

Students who calculated the concentration of water followed by calculation of the flux by multiplying avg velocity in concentration, obtained the full mark.

Partial credits:

Some students considered steam instead of water. This was regarded as basic mistake to solve the problem which caused the loss of all points.

7. Problem#7

Expected steps:

It was expected student show the diffusion coefficient is inversely correlated to the radius of the particle and then calculate D_1/D_2 or D_2/D_1 values.

8. Problem#8

Expected steps:

a.

It was expected student clearly show or mention ($D_{12} = D_{21}$)

b.

It was expected student show $D_1P_1 = D_2P_2$ and calculate the diffusion coefficient at 10 bar. Moreover, showing the correlation of D and P by showing general equation of D was also accepted.

c.

It was expected students show D is proportional to $T^{3/2}$ and calculate the diffusion coefficient at 100 °C. Moreover, showing the correlation of D and T by showing general equation of D was also accepted.

9. Problem#9

Expected steps:

Referring to valid diffusion method along with short explanation was sufficient to obtain the full mark. Each case out of six was assigned 2 points. 1 point for mentioning the diffusion type and 1 point for reasoning.

Partial credits:

Some student mentioned over than one diffusion method for each which was not acceptable in some cases. Moreover, partial loss of points was applied for cases that there was a mistake between diffusion type and explanation.