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| **Answer sheet** | Country code (2 letters) |   | Student number (1-5) |   |

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| 2.1 | Volume $V=$ Mass $M=$ Number $N=$ Charge density $ρ=$ Concentration $n=$ Charge $Q=$ Mass of the electron cloud $m\_{0}=$ | 0.7 |

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| 2.2 | Derive $E=A (ρ/ε\_{0}) x\_{d}$, with pre-factor $A=$  | 1.2 |

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| 2.3 | $F=$$W\_{el}=$  | 1.0 |

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| 2.4 | Displacement $x\_{p}=$ Displaced charge $-ΔQ=$  | 0.6 |

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| 2.5a | Expression $C=$ Value $C=$  | 0.7 |
| 2.5b | Expression $V\_{0}=$ | 0.4 |

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| 2.6a | Expression $W\_{kin}=$ Expression $I=$  | 0.7 |
| 2.6b | Expression $L=$ Value $L=$  | 0.5 |

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| 2.7a | Expression $ω\_{p}=$  | 0.5 |
| 2.7b | Value $ω\_{p}=$ Value $λ\_{p}=$  | 0.4 |

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| 2.8a | Expression $P\_{heat}=$ Expression $\left〈I^{2}\right〉=$ | 1.0 |
| 2.8b | Expression $R\_{heat}=$ Value $R\_{heat}=$ | 1.0 |

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| 2.9 | Expression $R\_{scat}=$ Value $R\_{scat}=$ | 1.0 |

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| 2.10a | Expression $P\_{heat }=$ Expression $P\_{scat}$=  | 1.2 |
| 2.10b | Values: $E\_{0}=$ , $P\_{heat }=$ , $P\_{scat}$= | 0.3 |

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| 2.11a | Value $μ\_{st}=$ | 0.6 |
| 2.11b | Value $η=P\_{st}/P\_{tot }=$ | 0.2 |

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|  | **Total** | **12.0** |