Week 8: Assignment 8

The due date for submitting this assignment has passed.

Due on 2021-10-20, 23:59 IST.

As per our records you have not submitted this assignment.

A flux quantum (fluxoid) is approximately equal to $2 \times 10^{-7}\ gauss - cm^2$ A type II superconductor is placed in a small magnetic field, which is then slowly increased till the field starts penetrating the superconductor. The strength of the field at this point is $\frac{2}{\pi} \times 10^5$ gauss

1) The penetration depth of this superconductor is *2 points*

- 100 Å
- 200 Å
- 1000 Å
- 314 Å

No, the answer is incorrect.
Score: 0

Accepted Answers:
100 Å

2) The applied field is further increased till superconductivity is completely destroyed. The strength of the field is now $\frac{8}{\pi} \times 10^5 gauss$. The correlation length of the superconductor is: *2 points*

- 20 Å
- 50 Å
- 628 Å
- 2000 Å

No, the answer is incorrect.
Score: 0

Accepted Answers:
50 Å

3) The transition temperature of a BCS superconductor with an average atomic mass of 199.5 is 4.18K. What is the transition temperature for an average atomic mass of 203.4? *2 points*

- 4.185
- 4.145
- 4.226
- 4.105

No, the answer is incorrect.
Score: 0

Accepted Answers:
4.145

4) The critical magnetic fields of a super-conductor at temperatures 4K and 8K are 11 mA/m and 5.5 mA/m respectively. The transition temperature is approximately? *2 points*

- 8.4 K
- 10.6 K
- 12.9 K
- 15.0 K

No, the answer is incorrect.
Score: 0

Accepted Answers:
10.6 K

5) For Nickel, the number density is 8×10^{23} atoms/cm^3 and the electronic configuration is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^8\ 4s^2$. The value of saturation magnetisation of Nickel in its ferromagnetic states is : (use $\mu_B = 9.21 \times 10^{-21}\ Am^2$) *0 points*

- $3.87 \times 10^8\ A/m$
- $4.97 \times 10^8\ A/m$
- $4.87 \times 10^9\ A/m$
- $3.97 \times 10^9\ A/m$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$3.97 \times 10^9\ A/m$