Unit 10 - Week 8

Assignment 8

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-25, 23:59 IST.

1) Calculate the value nuclear g factor from the following data (all in SI unit). 1 point

Value of Plank's constant in SI unit =6.625×10^{-34}

Field of permanent magnet = 0.45 T

μn (nuclear magnetron) = 5.05×10^{-27}

Resonance frequency = 18 MHz

(a) 5.24

(b) 2.52

(c) 4.77

(d) 6.12

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

2) If the angular momentum is I and μn = nuclear magnetron then torque experiences by nucleus placed in external magnetic field B [g = nuclear g factor] 1 point

(a) $\vec{\tau} = \frac{g\vec{I}\times\vec{B}}{\mu_n}$

(b) $\vec{\tau} = \frac{\vec{I}\times\vec{B}}{g\mu_n}$

(c) $\vec{\tau} = \frac{\vec{I}\times\vec{B}}{2g\mu_n}$

(d) All of above are wrong

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(d)

3) If spin quantum number of a nucleus is 3/2 then the energy level in presence of magnetic field will split into 1 point

(a) 2 levels

(b) 3 levels

(c) 4 levels

(d) 6 levels

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(c)

4) The energy difference between one energy level and its next higher energy level for a nucleus in presence of magnetic field is [notations have their usual meaning] 1 point

(a) $g_N\mu_N B$

(b) $g_N\mu_N B/2$

(c) 2 $g_N\mu_N B$

(d) $g_N\mu_N B/3$

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

5) The value of material constants 1 point

(a) 2 for Ge and 1 for Si

(b) 1 for Ge and 2 for Si

(c) 1.5 for Ge and 2.5 for Si

(d) 0.5 for Ge and 1.5 for Si

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b)

6) In experiment to find the material constant for the given semiconductor, the following data is obtained.[notations have their usual meaning] 1 point

ΔV = 0.4 Volt, Δln I = 9.6

Calculate the value of material constant at 280K using appropriate formula.

(a) 1.25

(b) 1.50

(c) 1.725

(d) 2.05

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(c)

7) In experiment to determine the energy band gap of the given semiconductor, the following data is obtained [notations have their usual meaning] 1 point

V(T) = 0.65 Volt, T = 393 K, dV =- 0.095 Volt, dT = 50K (from graph) and value mηKT/q = 0.076 (given).

Find the energy band gap using appropriate formula

(a) 1.32 eV

(b) 0.98 eV

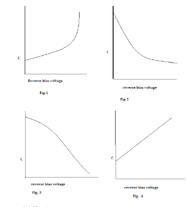
(c) 1.55 eV

(d) 0.78 eV

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

8) The nature of variation of depletion capacitance as a function of reverse bias voltage for a normal P-N diode is like 1 point



(a) Fig.-1

(b) Fig.-2

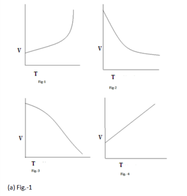
(c) Fig.-3

(d) Fig.-4

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b)

9) The nature of variation of junction voltage as a function of temperature for the base-emitter of N-P-N transistor is like- 1 point



(a) Fig.-1

(b) Fig.-2

(c) Fig.-3

(d) Fig.-4

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(d)

10) Calculate the value of nuclear magnetron (in SI unit) from following data. 1 point

Value of Plank's constant in SI unit =6.625×10^{-34}

Field of permanent magnet = 0.48 T

μn (nuclear magnetron) = 5.05

Resonance frequency = 18.5 MHz

(a) 5.255×10^{-28}

(b) 4.594×10^{-27}

(c) 5.056×10^{-27}

(d) 4.28×10^{-28}

(a)
(b)
(c)
(d)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(c)