PhysicsByAaryan

CSIR NET . GATE . JEST . BARC - Physics

Xray diffraction - CSIR NET Physics PYQs

Solid State Physics . All PYQs (2015-2025) with answer key

5 questions . Answer key included

www.physicsbyaaryan.com . www.csirnetphysics.com
Contact: 9501976811

Q1. [Dec 2015] . 5.0 marks

Solid State Physics > Xray diffraction

CSIR NET	2015 Dec	5 M

The first order diffraction peak of a crystalline solid occurs at a scattering angle of 30^0 when the diffraction pattern is recorded using an x-ray beam of wavelength $0.15nm$. If the error in measurements of the wavelength and the angle are $0.01nm$ and 1^0 respectively, then the error in calculating the inter-planar spacing will approximately be

1. $1.1 \times 10^{-2}\ nm$
2. $1.3 \times 10^{-4} nm$
3. $2.5 \times 10^{-2} nm$
4. 2.0×10^{-3} nm

Q2. [June 2015] . 5.0 marks

Solid State Physics > Xray diffraction

CSIR NET	2015 June	5 M

X-ray of wavelength $\lambda = a$ is reflected from the (111) plane of a simple cubic lattice. If the lattice constant is a, the corresponding Bragg angle (in radian) is

1. $\pi/6$
2. $\pi/4$
3. $\pi/3$
4. $\pi/8$

Q3. [Dec 2017] . 5.0 marks

Solid State Physics > Xray diffraction

CSIR NET	2017 Dec	5M

A crystal of MnO has NaCl structure. It has a paramagnetic to anti- ferromagnetic transition at 120 K . Below 120 K , the spins within a single [111] planes are parallel but the spins in adjacent [111] planes are antiparallel. If neutron scattering is used to determine the lattice constants, respectively, d and d', below and above the transition temperature of MnO then

1. $d = \frac{d'}{2}$
2. $d = \frac{d'}{\sqrt{2}}$
3. $d = 2d'$
4. $d = \sqrt{2}d'$

Q4. [June 2018] . 5.0 marks

Solid State Physics > Xray diffraction

CSIR NET	2018 June	5M

Sodium Chloride (NaCl) crystal is a face-centered cubic lattice with a basis consisting of Na^+ and Cl^- ions separated by half the body diagonal of a unit cube. Which of the planes corresponding to the Miller indices given below will not give rise to Bragg reflection of X-rays?

1. (220)
2. (242)
3. (221)
4. (311)

Q5. [June 2021] . 5.0 marks

Solid State Physics > Xray diffraction

CSIR NET	2021 June	5M

Potassium chloride forms an FCC lattice, in which K and Cl occupy alternating sites. The density of KCl is $1.98\ \mathrm{g/cm^3}$ and the atomic weights of K and Cl are 39.1 and 35.5, respectively. The angles of incidence (in degrees) for which Bragg peaks will appear when X ray of wavelength 0.4 nm is shone on a KCl crystal are

1. 18.5,39.4 and 72.2
2. 19.5 and 41.9
3. 12.5, 25.7, 40.5 and 60.0
4. 13.5, 27.8, 44.5 and 69.0

Answer Key

5 questions . Subject and topic for quick revision

Q. No	Subject	Topic	Answer
Q1	Solid State Physics	Xray diffraction	**1**
Q2	Solid State Physics	Xray diffraction	**3**
Q3	Solid State Physics	Xray diffraction	**3**
Q4	Solid State Physics	Xray diffraction	**3**
Q5	Solid State Physics	Xray diffraction	**1**

Study with PhysicsByAaryan

Full CSIR NET / GATE / JEST / BARC Physics live batch by Aaryan Mehra Sir.
Concept-first teaching, complete PYQ coverage, daily doubt support.

Use coupon CONSISTENCY for Rs. 500 off

Visit
www.physicsbyaaryan.com
www.csirnetphysics.com

Contact
9501976811