

X

NPTEL

reviewer4@nptel.iitm.ac.in ▼

Courses » Introduction to Materials Science and Engineering

Announcements

**Course**

Ask a Question

Progress

FAQ

## Unit 4 - Week 1 - Crystallography I

[Register for  
Certification exam](#)

### Course outline

[How to access  
the portal](#)[Supplementary  
Materials](#)

### Week 1 - Crystallography I

- 1.1 Introduction
- 1.2 Crystal geometry
- 1.3 Unit cell
- 1.4 Classification of lattices
- 1.5 Gaps in Bravais lattices
- 1.6 Symmetry I
- 1.7 Symmetry II
- 1.8 Classification of lattices on the basis of symmetry
- 1.9 A symmetry based approach to Bravais lattices

## Assignment 1

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

**Due on 2019-02-13, 23:59 IST.**

1) A given lattice has

**1 point**

- ☐ A unique unit cell
- ☐ A unique primitive unit cell and a unique non-primitive unit cell
- ☐ A unique primitive unit cell but more than one non-primitive unit cells
- ☐ More than one primitive unit cells and more than one non-primitive unit cells

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*More than one primitive unit cells and more than one non-primitive unit cells*

2) The face diagonal in a primitive tetragonal unit cell has a \_\_\_\_\_ rotation symmetry.

**1 point**

- ☐ 4-fold
- ☐ 3-fold
- ☐ 2-fold
- ☐ 6-fold

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*2-fold*

3) A crystal has a lattice with the following lattice parameters:  $a=b=c$  and  $\alpha=\beta=\gamma=90^\circ$ . "The crystal will definitely have cubic symmetry." True/False?

**1 point**

- ☐ True

© 2014 NPTEL - Privacy & Terms - Honor Code - FAQs -

A project of



**NPTEL**

National Programme on  
Technology Enhanced Learning

In association with

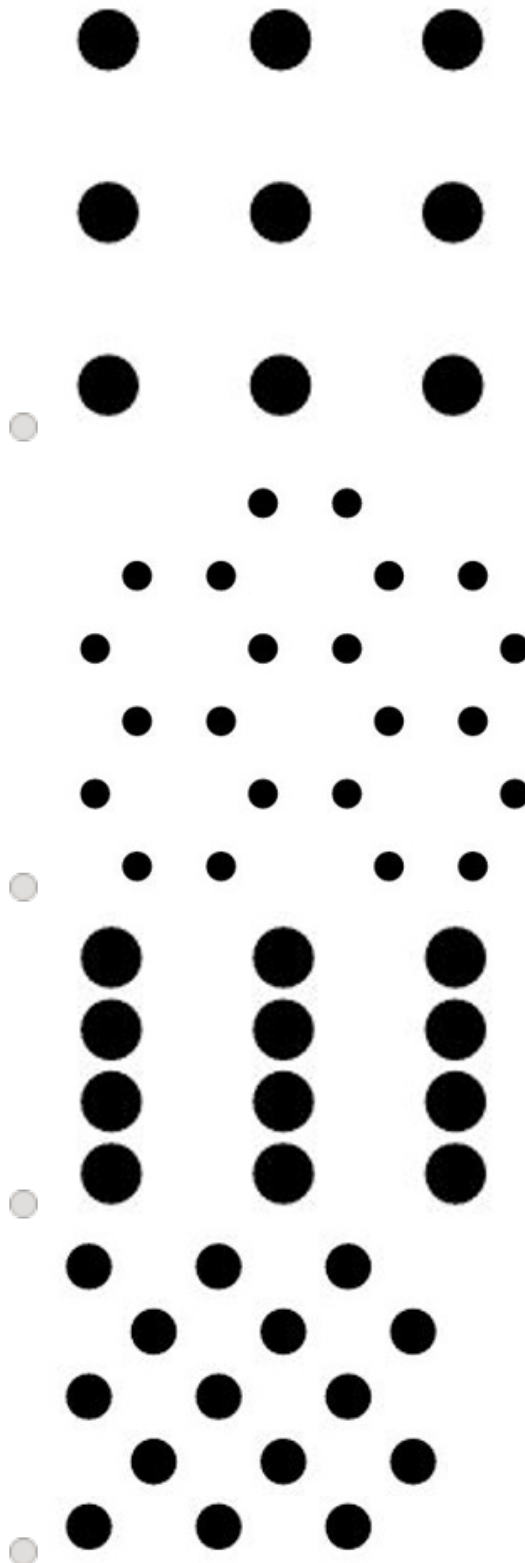
**NASSCOM**

Funded by

**Crystallography  
II + Structure of  
Solids I****Week 3 -  
Structure of  
Solids II****Week 4 -  
Structure of  
Solids III****Week 5 - Defects  
in Crystalline  
Solids I****Week 6 - Defects  
in Crystalline  
Solids II****Week 7 - Phase  
Diagrams I****Week 8 - Phase  
Diagrams II +  
Diffusion****Week 9 - Phase  
Transformations  
I****Week 10 - Phase  
Transformations  
II + Mechanical  
Behaviour of  
Materials I****Week 11 -  
Mechanical  
Behaviour of  
Materials II****Week 12 -  
Mechanical  
Behaviour of  
Materials III +  
Fracture****Interactive  
Session**

ce De

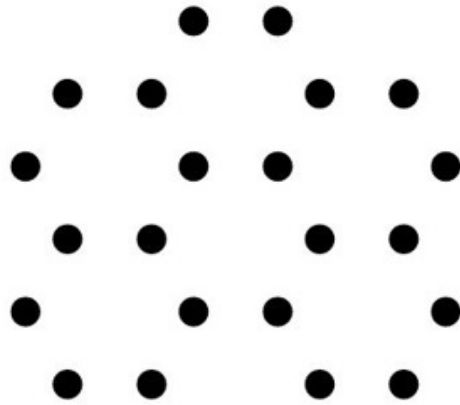
circles. In all but one, the centres of all the circles do not form a lattice. Which one?



No, the answer is incorrect.

Score: 0

Accepted Answers:



5) Which of the following lattices does not have a 2-fold axis?

1 point

- ☐ Cubic  $F$
- ☐ Tetragonal  $P$
- ☐ Hexagonal  $P$
- ☐ None of the above

No, the answer is incorrect.

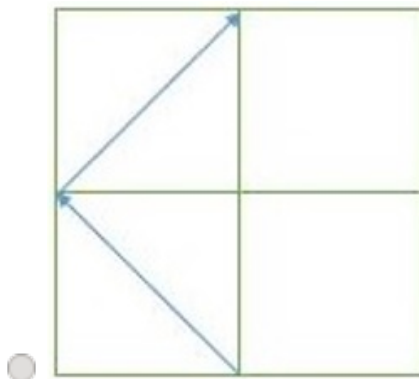
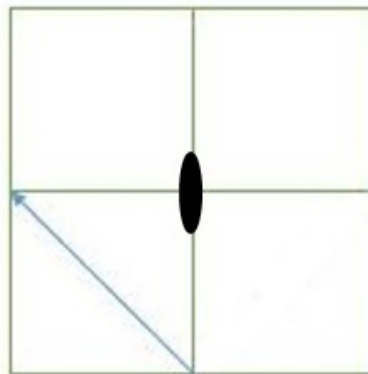
Score: 0

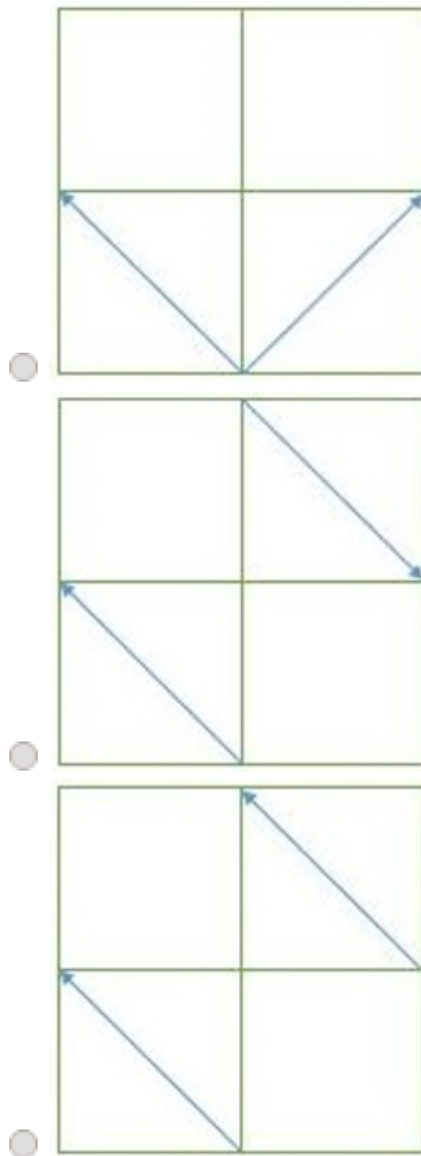
Accepted Answers:

None of the above

6) To the pattern shown below, if a diad passing through the middle is added as shown, identify the resulting pattern.

1 point

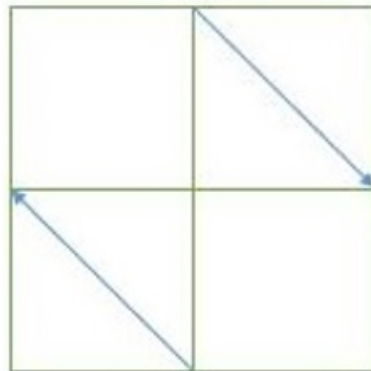




No, the answer is incorrect.

Score: 0

Accepted Answers:



7) How many triads (3-fold axes) are present in a cube?

1 point

- ☐ 1
- ☐ 2
- ☐ 3

☐ 4

No, the answer is incorrect.

Score: 0

Accepted Answers:

4

8) Choose the correct ascending order of effective number of lattice points per unit cell: **1 point**

P = Triclinic  $P <$  Orthorhombic  $F <$  Monoclinic  $P <$  Tetragonal  $I$

Q = Triclinic  $P <$  Monoclinic  $P <$  Tetragonal  $I =$  Orthorhombic  $F$

R = Orthorhombic  $F <$  Monoclinic  $P <$  Tetragonal  $I <$  Triclinic  $P$

S = Triclinic  $P =$  Monoclinic  $P <$  Tetragonal  $I <$  Orthorhombic  $F$

☐ P

☐ Q

☐ R

☐ S

No, the answer is incorrect.

Score: 0

Accepted Answers:

S

9) In Q4 above, two of the patterns are exactly identical except for the scale. Which two? **1 point**

☐ (a) and (b)

☐ (a) and (c)

☐ (a) and (d)

☐ (b) and (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) and (d)

10) If lattice points are added to the centres of the square faces of a tetragonal  $P$  unit cell, the resultant Bravais lattice will be \_\_\_\_\_. **1 point**

☐ tetragonal  $C$

☐ orthorhombic  $C$

☐ tetragonal  $P$

☐ orthorhombic  $P$

No, the answer is incorrect.

Score: 0

Accepted Answers:

tetragonal  $P$

Previous Page

End

