

**PRINCE OF SONGKLA UNIVERSITY  
FACULTY OF ENGINEERING**

Mid-term : semester 2

Academic Year : 2004

Date : December 26, 2004

Time : 13.30 – 16.30

Subject : 226-323 Engineering Metallurgy

Room : R300

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**Instruction**

1. Attempt all questions.
2. Write answers in this examination paper.
3. All materials are allowed to the examination room.
4. The points are as follows :

Question No	1	2	3	4	5	6	7
Full points scored	12	16	16	16	8	12	10

ทฤษฎีในการสอบ โทษขั้นต่ำคือปรับตกในรายวิชาที่ทฤษฎีและพักการเรียน 1 ภาคการศึกษา

Boonrueing Manasurakarn

instructor



1. Briefly cite the main differences between ionic, covalent, and metallic bonding.  
( 12 points)

2. Calculate the atomic packing factor of an FCC unit cell.  
( 16 points )

2. Copper at  $20^{\circ}\text{C}$  has a structure of FCC, atomic radius is  $0.128\text{ nm}$ .
- 2.1 What is the cell constant? (8 points)
- 2.2 What is the lattice constant? (8 points)

4. Calculate the volume of cobalt unit cell with HCP structure, lattice constant  $a = 0.2507 \text{ nm.}$ , and  $c = 0.4069 \text{ nm.}$  (16 points)

*Syafiq*

7. How are properties of solid materials Formed ? ( 10 points)

*Supra*