

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination : Semester 2
Date : 27 February 2007
Subject : 226-508 Heavy Industrial Furnace

Academic Year : 2006
Time : 09.00-12.00
Room : A401

ทฤษฎีในการสอบโทษขั้นต่ำ คือ ปรับตกในรายวิชาที่ทฤษฎี และพักการเรียน 1 ภาคการศึกษา

Instruction :

1. Do all of 19 problems.
2. The score appears at the end of each problem.
3. Total score is 109.
4. Notes, books and calculator are allowed,
5. Write the answers on the question pages.
6. Don't ask anyone.
7. Put Your ID no. and name on every pages.

ผศ. เสน่ห์ รัชชานาถลักษณ์
ผู้ออกข้อสอบ

Name.....ID.....

1. Given LPG of 11000 Kcal/kg, 1000 lbs of silica chamotte, 15% of total efficiency and 1200-1350 °C within 3 hrs. (15)

(a) Find Kcal of input.

(b) What is the consumption rate of fuel ?

(c) How many burners of 2 kgs/hr are required ?

2. Given a front slagging cupola of inside diameter = 80 cm, H/D = 5.5, melting rate = 4 tons/hr 6 tuyeres and the tuyeres ratio = 7. Find.....(20)

(a) h.

(b) the tuyere diameter.

(c) the height from bottom to lower of charging door.

(d) the coke size.

(e) the coke bed height.

3. Given a crucible furnace of Cu-alloy 70 kgs/hr, 10 litres crucible and the oil of 95000 kcal/kg. Find.....(10)

(a) the percentage of crucible for 100 kgs of the metal.

(b) the fuel consumption rate with 15% total efficiency.

Remark The Cu-alloy density is 8.3 g/cc

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Name.....ID.....

4. How is steel produced from iron? (4)
5. How many types of arc furnace? What are they? (4)
6. Why must a basic arc furnace be used for two slag process? (4)
7. What is the disadvantage of partial oxidation process? (4)
8. Why could steel be molten by an induction furnace? (4)
9. On what does the cycletime of induction melting depend? (4)
10. What are the advantages of induction furnace? (4)
11. What is cupola? (4)
12. How many types of cupola could be used? What are they? (4)
13. How do you line a cupola of 80 cm inside diameter? (4)
14. What is inoculation? (4)

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Name.....ID.....

15. How many types of furnace could be used for ductile iron production? What are they? (4)

16. How can you produce nodular iron? (4)

17. Tell me the difference between a ladle and a forehearth. (4)

18. Why should is a bottom poured-ladle be used for molten steel? (4)

19. A steel mill needs a furnace to produce 150 tons of molten steel per heat? What is the furnace? (4)

