

**PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING**

Final Examination : Semester 1

Academic Year : 2007

Date : 14 October 2007

Time : 09.00-12.00

Subject : 226-316 Foundry Engineering

Room : A 401

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ทฤษฎีในการสอบโทษขั้นต่ำ คือ ปรับตกในรายวิชาที่ทฤษฎี และพักการเรียน 1 ภาคการศึกษา

Instructions:

- 1. Do all 23 questions.**
- 2. The mark appears at the end of each question.**
- 3. Total score is 100.**
- 4. You must answer on the question sheets.**
- 5. During the time of exam. You are not allowed to ask anyone.**
- 6. Calculator, book and notes are allowed.**
- 7. Put your name and ID on every page.**

Asst. Prof. Sane Thanthalug



1. What is the different value of liquids and solids temperature for pure copper ? (3.5)

2. There are 4 molding materials as followings : brass , copper , steel and molding sand. Tell me in order of low to high freezing time of the Al-alloy casting. (3.5)

3. There is a steel casting with 2,3 and 3.5 inches of thickness. Where should the riser be put on ? (3.5)

4. Tell me the volume percentage of pure aluminium contraction at liquid and solid stages. (3.5)

5. How many zones are there after pouring Cu-alloy into a mold ? What are they?(3.5)

6. What type of chemical composition for ferrous alloy could provide the lowest liquidus temperature ? (3.5)

7. A, B and C are normal, exothermic topping and sleeve with exothermic topping open riser. Tell me the largest and smallest riser. (3.5)

8. There are 4 alloy casting as following : Al-alloy, bronze, steel and cast iron. What alloy is the smallest shrinkage ? (3.5)

A handwritten signature in black ink, appearing to read 'L. H. R.', is located in the bottom right corner of the page.

9. A foundryman said that there are 2 types of riser. One is open riser. What is the other ? (3.5)

10. What gas could molten Al-alloy absorb ? (3.5)

11. A foundryshop has to produce ferrous and non-ferrous alloys. Only one melting furnace could be used. What is the furnace ? (3.5)

12. Why is a deoxidising tube used in a melting furnace ? (3.5)

13. Tell me 3 furnaces which are used in steel production . (3.5)

14. What is the difference between forehearth and ladle ? (3.5)

15. What is done before filling nodulant into the ladle ? (3.5)

16. How is malleable iron produced ? (3.5)

17. Why should the core for steel casting be heigh permeability ? (3.5)



18. What is inoculation ? (3.5)

19. Why is the riser of white iron casting bigger than grey iron ? (3.5)

20. How many types of cupola ? What are they ? (3.5)

21. Given a C-steel ring with inside diameter of 16 , outside diameter of 25, thickness of 4.5 inches and the ratio of height and diameter of riser = $\frac{3}{4}$.

Find (a) number of risers.....(4)

(b) the shape factor.....(4)

(c) the diameter of each riser (4)

22. A, B and C are red brass castings with the weight and surface areas of 8,9,10 kilograms and $500,570,630 \text{ cm}^2$.

Find (a) their moduli.....(4)

(b) the one that provides the least freezing time.....(4)

23. Given a crucible furnace of Cu-alloy 70 kgs/hr, 10 litres crucible and the oil of 9,500 kcal/kg.Find.....

(a) the percentage of crucible for 70 kgs of the molten metal .(5)

(b) the fuel consumption rate with 15% total efficiency.(5)

Remark The Cu-alloy density is 8.8 g/cc and $\Delta \text{Temp} = 1300 \text{ }^\circ\text{C}$