

**Prince of Songkla University  
Faculty of Engineering**

**Midterm Examination : Semester I      Academies Year : 2006**  
**Date : 6 August 2006                      Time : 13.30-16.30**  
**Subject : 226-316 Foundry Engineering      Room : A๕๐3**

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ทุกชนิดในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้นและพักการเรียน 1 ภาคการศึกษา

***Instructions:***


1. *Do all 24.*
2. *Each of no. 1-20 scores 3 and the marks of others appear after the end of questions.*
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 Thanthalugsana*

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1. What will you do after molding and melting?
  
2. There are 4 steel castings A, B, C and D. The weights of A, B C and D are 100, 20, 10 and 2 kgs. Only one of them could be produced by powder metallurgy. What is the one?
  
3. There are 2 reasons behind corner of pattern in round shape? One is strength of material. What is the other?
  
4. What are the components of molding sand?
  
5. There are 4 molten metals as follows: bronze, gray iron, Mn-steel and Mg-aluminum. What does provide the heighest pressure against mold wall?
  
6. What do you use to coat the wall mold for Mn-steel casting?
  
7. Given the time of 2,000 cc., flowing through the specimen under 10 g/sq.cm. is 62 seconds. What is the permeability?
  
8. Normally what kind of strength should be tested for the specimen of molding sand?

9. Why is sodium silicate mixed with sand before CO<sub>2</sub>-process molding?
10. How many types of centrifugal casting machines? What are they?
11. Without core, what type of casting could be used for hollow metal part?
12. What could occur if the molten alloy is poured into the crack mold?
13. There are 4 parts to let molten alloy flow into mold? What are they?
14. A foundryman said that the straight sprue would cause turbulence into a mold? How should that sprue be redesigned?
15. What theory is used to prove that sprue should be tapered?
16. What is the first part to allow molten alloy flowing into a mold?
17. How many types of gating? What are they?



18. How should you design the runner with different cross section areas?
19. How many important factors affect the fluidity of molten alloy?
20. What does control the flow rate of molten alloy under the pouring time?
21. Given iron product of 10 kgs with 6 kgs of gating and risering systems 2,000 castings have to be produced by cupola. How much metal should be charged into the cupola? .....(5)
22. A foundryshop has yearly to pay 5.0 millions bath back to a bank and 1.0 million of fixed manufacturing cost. The vanable unit cost is 2,200 and the unit selling price is 3,000.
- (a) How many castings should be produced with no-loss and no-gain? ...(5)
- (b) How many pieces should be cast if the shop needs to obtain annual profit of 2 millions baht? .....(5)
23. Given pouring time = 54 sec., gray iron casting weight of 4,096 lbs, with average thickness = 3 in., and C.F. = 3.55 Find the fluidity and pouring temperature .....(12)
24. Given  $h, c, p = 8, 5, 2$  in., single gate, the depth of pouring basin = 2.0 inches,  $w = 150$  lbs,  $tp = 10$  seconds,  $d = 0.28$  lb/cu.in., gating ratio of 1:3:3 and  $j = 0.88$ . Find  $A_B, A_T, A_R$  and  $A_g$  of this parting line gating system. ....(5)

MSR/10/2