

SULIT



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**PEPERIKSAAN AKHIR
SEMESTER II
SESI 2011/2012**

NAMA KURSUS : PROSES PENUANGAN LOGAM
KOD KURSUS : BDD 4063
PROGRAM : SARJANA MUDA KEJURUTERAAN
MEKANIKAL DENGAN KEPUJIAN
TARIKH PEPERIKSAAN : JUN 2012
JANGKA MASA : DUA (2) JAM TIGA PULUH (30) MINIT
ARAHAN : JAWAB EMPAT (4) DARIPADA LIMA (5)
SOALAN.

KERTAS SOALAN INI MENGANDUNGI TIGA (3) MUKA SURAT BERCETAK

SULIT

- S1**
- (a) Why is it important to provide a means of venting gases from the mold cavity?
(6 marks)
 - (b) Analyze the roles of casting volume and surface area as they relate to the total solidification time and Chvorinov's rule ?
(6 marks)
 - (c) Explain how does sand affect the quality aspects of the casting?
(6 marks)
 - (d) Illustrate some of the possible approaches that can be taken to prevent the formation of gas porosity in a metal casting?
(7 Marks)
- S2**
- (a) What is fluidity, and how can it be measured?
(6 marks)
 - (b) What is a misrun and what causes them to form?
(6 marks)
 - (c) Explain the defect which can form in sand castings if the pouring temperature is too high and fluidity is too great?
(6 marks)
 - (d) Why is it important to design the geometry of the gating system to control the rate of metal flow as it travels from the pouring cup into the mold cavity?
(7 marks)
- S3**
- (a) Describe the two stages of solidification?
(6 marks)
 - (b) Name some of the key features observed in the cooling curve of a pure metal.
(6 marks)
 - (c) Propose the correlation between cooling rate and final properties of a casting?
(7 marks)
 - (d) What is the chill zone of a casting, and why does it form?
(6 marks)

- S4**
- (a) Analyze what are the features which affect the life of a permanent mold? (7 marks)
 - (b) If you need only five units of casting, which process would you use? Explain your reason. (6 marks)
 - (c) What are some of the major disadvantages of the expandable-mold casting process? (6 marks)
 - (d) Why are allowances provided in the production of patterns? (6 marks)
- S5** During pouring into a sand mold, the molten metal can be poured into the downsprue at a constant flow rate during the time it takes to fill the mold. At the end of pouring the sprue is filled and there is negligible metal in the pouring cup. The downsprue is 6.0 in long. Its cross-sectional area at the top = 0.8 in^2 and at the base = 0.6 in^2 . The cross-sectional area of the runner leading from the sprue also = 0.6 in^2 , and it is 8.0 in long before leading into the mold cavity, whose volume = 65 in^3 . The volume of the riser located along the runner near the mold cavity = 25 in^3 . It takes a total of 3.0 sec to fill the entire mold (including cavity, riser, runner, and sprue. This is more than the theoretical time required, indicating a loss of velocity due to friction in the sprue and runner. Find
- (a) the theoretical velocity and flow rate at the base of the downsprue; (6 Marks)
 - (b) the total volume of the mold; (6 Marks)
 - (c) the actual velocity and flow rate at the base of the sprue; and (6 Marks)
 - (d) the loss of head in the gating system due to friction. (7 marks)