THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF ENGINEERING TECHNOLOGY
DIPLOMA IN TECHNOLOGY – LEVEL 3
FINAL EXAMINATION 2006/2007
MEX3233/MED1205 -WORHSHOP TECHNOLOGY

DATE : 31st MARCH 2007.
TIME : 10.15-12.30HRS.
DURATION : TWO HOURS AND FIFTEEN MINUTES.

PART- B

Answer five questions only. All questions carry equal marks.

Question 1

(a) What is a phase diagram?

(b) State the features that are useful in identifying phases.

(c) One kilogram of an alloy of 75% Pb and 25% Sn is slowly cooled from 300 ^{0}C to room temperature. Using Pb-Sn phase diagram given in fig Q1, calculate the weight present of liquid and solid at point D.

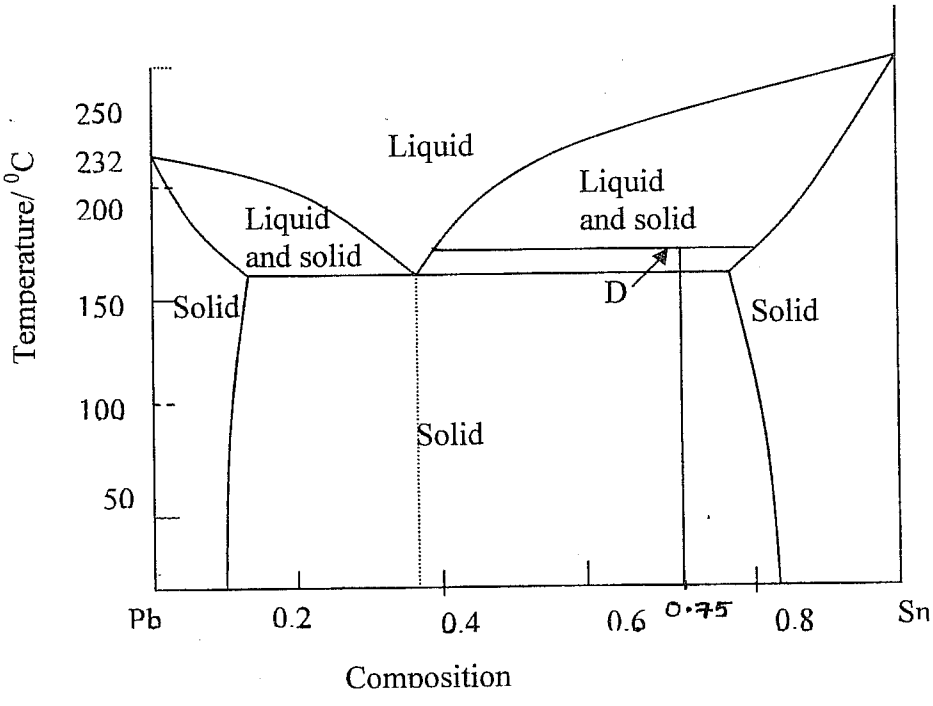


Figure no Q1

Question 2

(a) With the aid of clear sketches, state the difference between counter boring and spot facing.

(b) What precautionary procedures should be followed when drilling a deep vertical hole in mild steel with an ordinary twist drill?

(c) What is the metal removal rate when a 4 mm deep, 40 mm diameter hole is drilled at a cutting speed of 75 m/min with a feed of 0.1 mm/rev?

Question 3

(a) With a sketch explain how a work piece is mounted between centers on a lathe.

(b) What will happen to the shape of the work piece by turning on a lathe, if it was held between centers with the centers not exactly in line?

(c) What is the basic difference between "facing" and "parting off" operations?

Question 4

(a) Describe the spark – test method for identifying steels.

(b) How may steel be classified according to carbon content?

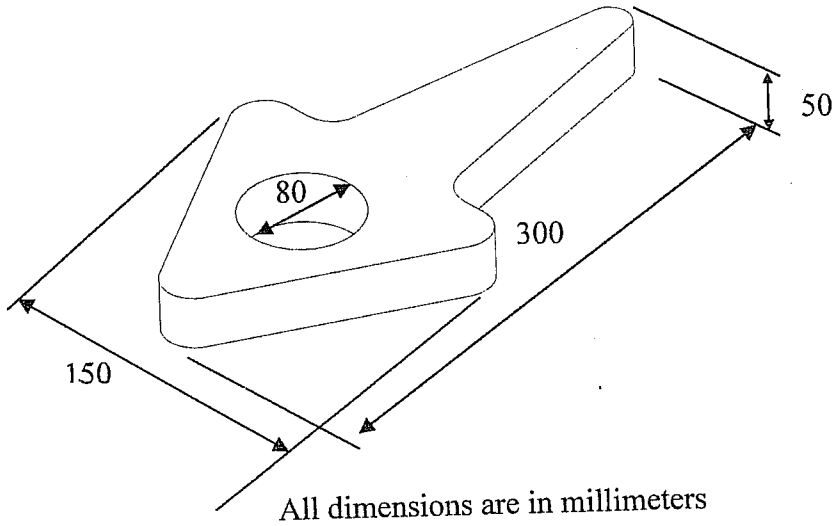
(d) Explain the process of carburizing steel.

Question 5

(a) What factors should be considered when providing the gate of a mold in sand casting?

(b) Discuss the advantages and limitations of investment casting.

(c) Explain each step in casting the following component by sand casting.



All dimensions are in millimeters

Figure no Q5

Question 6

(a) Define the following phases, which are present in the iron-carbon phase diagram.

Austenite	Cementite
α-Ferrite	δ-Ferrite

(b) What is the structure of perlite?

(c) Distinguish between the following three types of plain carbon steel.

(I). Eutectoid

(II). Hypoeutectoid

(III). Hypereutectoid

Question 7

(a) Write down the most important factors, which contribute to the cutting efficiency when selecting a cutting a tool.

(b) Why doesn't the build up edge form on the cutting tool when operating at low cutting speeds?

(c) What are the main purposes of providing the rake angle on a cutting tool?

Question 8

(a) What are the similarities and differences between piercing and blanking?

(b) Explain the functions of pressure pads in a deep drawing.

(c) State the salient considerations one needs to address when producing a component by metal drawing.

Question 9

(a) What conditions should be satisfied for an ideal metallurgical bond between the metal pieces being joined by welding?

(b) Compare the down hand welding and vertical welding methods in gas welding.

(c) What are the factors you have to consider before selecting the welding rod?