



Note: answer five questions only

Q1

- A) The inside wall of blast furnace covering by special refractories and brick, show that.
B) What are the general safety guidelines in the work place?

(20) marks

Q2:

- A) Explain in detail with drawing the electrical furnace which used for steel production.
B) What are the general features for casting process?

(20) marks

Q3:

- A) What are the objectives of pattern in sand casting process?
B) What are the important classifications of grinding wheels?

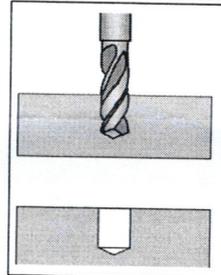
(20) marks

Q4:

A drilling operation is to be performed in a block of magnesium alloy
(As show in the figure) the diameter of twist drill is (13.7 mm).
The hole is a blind hole at a depth of 70 mm.

The cutting speed V is (20 m/min) and the feed is
(0.20 mm/rev) and the half of the drill point (30°). Determine

- (a) The cutting time to complete the drilling operation
(b) Metal removal rate MRR during the operation, after the drill bit reaches full diameter.



(20) marks

Q5:

Two turning cutting tools made from different materials (1, 2). Both tool working under the same specific conditions (cutting speed was (75 m/min) and for (2 min)).

Found that angle of curved cutting edge for material (1) was (55°) and for material (2) was (40°).

Determine which one is better to machined shaft of aluminum alloy with (170 mm) length and (30 mm) in diameter when the spindle rotate at (400 rpm) and the feed was (0.05 mm/rev).

(20) marks

Q6:

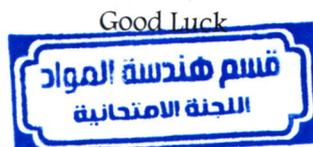
Drawing process was used to produce wire with 3.70 mm diameter. Calculate

- 1- How many times of drawing process needed?
2- How many times of heat treatment process needed?

When the original radius for the wire was 3.4 mm and the maximum reduction allowable for the instrument is 25%. The percentage in reduction area 60% for each heat treatment process.

(20) marks

Examiner signature



Head of department signature