

5. Suggest suitable materials and manufacturing processes for the production of a small ship's propeller. Explain how the choice of material and process for such a component will be influenced by economic factors. (20%)
6. Describe the basic features of hot working, cold working and casting processes as applied to the manufacture of aluminium components. What are the principal reasons for hot working of metals? (15%)
7. The use of powder metallurgy in the production of components for use at high temperatures can offer both economic and metallurgical advantages over more conventional forming processes. Outline the essential steps of this fabrication route and discuss its advantages and limitations. (15%)

1. Give the definitions for the following terms:

- (a). Manufacturing.(2%)
- (b). Manufacturing production.(2%)
- (c). Manufacturing processes.(2%)
- (d). Manufacturing engineering.(2%)
- (e). Manufacturing system.(2%)

2. A part design with assigned tolerance was shown in Fig. 1. Use the arithmetic method to calculate the following tolerance information for the axial dimension H.

- (a). Nominal dimension of H.(3%)
- (b). Maximum dimension of H.(4%)
- (c). Upper tolerance on H.(4%)
- (d). Lower tolerance on H.(4%)

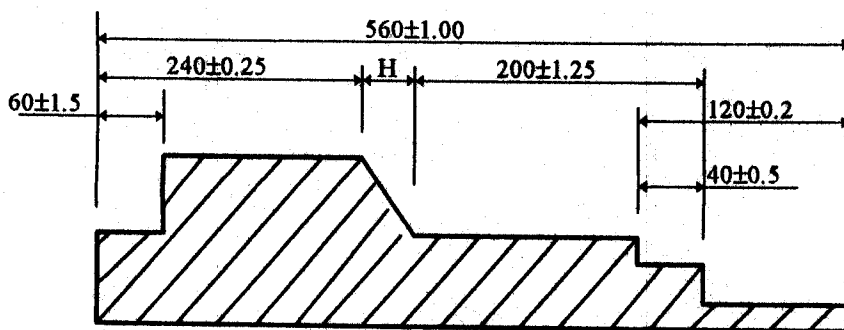


Fig. 1(Unit:mm)

3. In the wire electrical discharge machining (WEDM) process, wire rupture reduces the machining productivity and also damages the machined surface.

- (a). Give at least four names of the factors affecting wire rupture phenomena in WEDM process. (5%)
- (b). Discuss the effects of the factors given in (a). (10%)

4. State which you consider the more versatile, LBM or EBM, and why? (10%)

LBM : Laser beam machining ; EBM : Electron beam machining.

(背面仍有題目,請繼續作答)