國立臺灣科技大學
九十二學年度碩博士在職專班招生考試試題
系所組別：工程技術研究所在職專班甲組
科　目：科技實務

總分100分

1. Please explain the following: (50%)

(1) SCM	(2) AI
(3) CAD/CAM	(4) PDM
(5) CALS	(6) AS/RS
(7) FMS	(8) PID control
(9) Nyquest frequency	(10) Sampled Data System

2. Please compare Laplace Transform and Fourier Transform: (20%)

(1) Please describe the definition of Laplace Transform and Fourier Transform? (6%)

(2) Explain the existence conditions for Laplace Transform and Fourier Transform. (6%)

(3) Discuss the transformation relations between Laplace Transform and Fourier Transform?(8%)

3. Please translate the following text into Chinese: (30%)

In modern hard disk drives, magnetic materials have now the capacity of storing hundreds of Gbits per square inch. This capacity, however, has not been fully exploited yet, due to the difficulties in obtaining a precise servo-positioning over a sub-micro size track. According to the literature, the main limitations are due to the limited bandwidth of the servo-positioning system. However, another aspect that has been often neglected is the non-linear friction of the voice coil motor bearing, which causes a stick-slip motion during fine servo positioning. One solution to overcome these limitations is to add a secondary actuator, placed close to the head. This actuator, designed for sub-micron motions, can increase the bandwidth of the servo system and correct the effects of the non-linear friction. For this secondary actuator, different technologies have been proposed, like piezoelectric. This paper described the study on a system with a piezoelectric active suspension. The use of piezoelectric actuators to move the HDD head, has been widely described in the literature. The idea is to insert a piezoelectric stack in the head suspension, in order to command a horizontal deflection of the suspension itself. Most of the implementations of such type of "active" suspension have a push-pull configuration, with the suspension modified so that to obtain a pivot, around which the rigid part of the suspension rotates, according to the lengthening or shortening of the piezoelectric stacks. The active suspension is mounted on a rigid structure, resulting in a overall mechanical system that can be schematized as in Fig. 1. Here, two piezoelectric stacks in push-pull configuration move the rigid part of the suspension around the pivot.