

# 國立中山大學 106 學年度碩士暨碩士專班招生考試試題

科目名稱：工程英文【機電系碩士班丁組】

題號：438001

※本科目依簡章規定「不可以」使用計算機(混合題)

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- I. 選擇題 You are to choose the word, phrase or selection that best completes the sentence or meets the meaning of the condition. Then, on your answer sheet, find the number of the question and mark your answer. (20% in total, 2% each, 單選, 共 20 分, 每題 2 分, 請劃記於答案卡上)
1. The worm lead angle plus the worm helix angle is  $90^\circ$ . The worm lead angle is the ( ) the worm helix angle. (a) basic to, (b) term with, (c) result in, (d) complement of.
  2. ( ) is the error between a number of successive attempts to move the machine to the same position. (a) Precision, (b) Accuracy, (c) Resolution, (d) Reliability.
  3. Optical fibers transmit light using the property of total internal ( ). (a) reflection, (b) transmission, (c) refraction, (d) projection.
  4. To ( ) the results, the product of crank angular velocity and crank length may be assigned a value of unity. (a) design, (b) normalize, (c) normal, (d) view.
  5. A ( ) is a machine tool used for producing surfaces of revolution. (a) boring machine, (b) tapping machine, (c) lathe, (d) milling machine.
  6. What kind of failure theories are adequate for brittle materials? (a) Maximum normal stress, (b) Maximum shear stress, (c) Ductile Coulomb-Mohr, (d) Distortion energy.
  7. ( ) is used to define the plastic deformation of metals at elevated temperatures into predetermined shapes using compressive forces. (a) Casting, (b) Forging, (c) Injection molding, (d) Welding.
  8. For a planar four-bar linkage, if the coupler is shortest, the inversion of the crank-rocker mechanism is called a ( ). (a) double-crank mechanism, (b) rocker-crank mechanism, (c) drag-link mechanism, (d) double-rocker mechanism.
  9. How many degree-of-freedom does a flying object have? (a) Three, (b) Four, (c) Five, (d) Six.
  10. ( ) is the study of motion in mechanisms without reference to the forces that act on the mechanism. (a) Newton's second law, (b) Kinetics, (c) Kinematics, (d) Dynamics.

II. 中翻英 Chinese-English Translation. 參考以下中文內容, 將中文內容翻譯成英文, 寫於答案紙上 Translate the following Chinese passages into English passages. Write your answer on the answer sheet. (共 25 分)

1. 現今製造業面臨了很多挑戰, 例如: 全球性競爭與快速變化的客戶需求。這些挑戰促成同步工程(Concurrent engineering)的採用。同步工程是一種涉及在最短時間內上市最高品質且最具價格競爭力產品的開發過程管理哲學。一個瞭解這種新觀念的好方法就是與應用於產品開發過程的傳統工程方法來比較。(15%)

2. 機械工程是一門應用工程學、物理學與材料科學原理於機械系統設計、分析、製造與維護的學科。機械工程範疇(field)需要瞭解力學、製造學、熱力學、材料科學與電學的核心領域(area)。(10%)

背面有題

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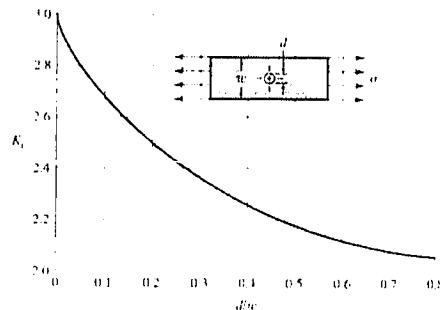
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## III. 英翻中 English-Chinese Translation. (共 30 分) 請寫於答案紙上

1. Geometric errors are defined here as errors in form of individual machine components (e.g. straightness of motion of a linear bearing). Geometric errors are concerned with the quasi-static accuracy of surfaces which move relative to each other, such as components of linear and rotary axes. (5%)
2. There were 19 participants in total, 18 males and 1 female, accepting the new creativity test. All of them were under undergraduate students. Both pre-course and post-course tests were conducted. (5%)
3. The Taguchi method is applied to minimize experimental numbers and to collect experimental data representing the quality performances of a system. A process parameters design for a titanium dioxide thin film in the vacuum spraying process is studied in this application study. (5%)
4. Parameter studies are an aid in selecting optimum linkage dimensions and speeds. We might examine velocities in a particular class of linkages, without specifying actual dimensions or speeds. To be as general as possible, a family of curves of velocity versus crank angle can be plotted. (5%)
5. Industry 4.0 is the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things and cloud computing. These principles support companies in identifying and implementing Industry 4.0 scenarios. (5%)
6. Suppose the link lengths, configuration, and crank speed are specified and we have already solved the position and velocity equations. Let the drive crank angular velocity and acceleration be given. (5%)

## IV. Questions 問答題 (共 25 分)。Answer the below questions in English or Chinese on your answer sheet. 回答下列問題，並寫在答案紙上，可以中文或英文回答。

1. What is the meaning of the term “metal forming”? (3%)
2. What is the meaning of the term “tolerance”? (3%)
3. What is the meaning of the term “anneal”? (3%)
4. What is the meaning of the term “fatigue failure” and how to prevent fatigue failure occurring? (6%)
5. What is the meaning of the term “stress concentration” and how to use the below figure? (6%)



6. What is the meaning of the term “work hardening (strain hardening)”? (4%)