

104 年度第 2 次研究生入學能力考試試題

科目： 英文

考試日期： 104 年 8 月 1 日

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本試題包含二大部份：閱讀測驗題與翻譯題，共 100 分

第一部份：閱讀測驗題(單選題)(有三篇短文，共 12 題，每題 5 分，共 60 分)

[請依據短文之內容答題]

第一篇短文：

A substance that has a fixed chemical composition throughout is called a pure substance. Water, nitrogen, helium and carbon dioxide, for example, are all pure substances. A pure substance does not have to be of a single chemical element or compound. A mixture of various chemical elements or compounds also qualifies as a pure substance as long as the mixture is homogeneous. Air, example, is a mixture of several gases, but it is often considered to be a pure substance because it has a uniform chemical composition. However, a mixture of oil and water is not a pure substance. Since oil is not soluble in water, it will collect on top of the water, forming two chemically dissimilar regions.

Similarly, a mixture of two or more phases of a pure substance is still a pure substance as long as the chemical composition of all phases is the same. A mixture of ice and liquid water is a pure substance because both phases have the same chemical composition. A mixture of liquid air and gaseous air is not a pure substance since the composition of liquid air is different from the composition of gaseous air and thus the mixture is no longer chemically homogeneous. This is due to different components in air condensing at different temperature at a specific pressure.

1. Which in the following is correct to describe a pure substance?
 - (1) A substance does not change its geometry at all time,
 - (2) A substance does not change its form at all time,
 - (3) A substance does not change its chemical composition at all time,
 - (4) A substance does not change its purity at all time.
2. Which in the following can be called a pure substance?
 - (1) A mixture of ice and carbon dioxide,
 - (2) A mixture of homogenous Nitrogen and homogeneous water,
 - (3) A mixture of ice and gaseous water (vapor),
 - (4) A mixture of water and air.
3. Why the mixture of water and oil is not a pure substance?
 - (1) Because composition of oil is complex and oil is not homogeneous,

- (2) Because water and oil have different chemical elements,
 - (3) Because oil and water cannot be homogeneously mixed,
 - (4) Because pure substance can only contain two materials.
4. Why the mixture of liquid air and gaseous air is not a pure substance?
- (1) The air has same chemical composition in both the liquid and gaseous phases,
 - (2) The air in both liquid and gaseous phases is chemically homogeneous,
 - (3) The chemical composition in liquid air and gaseous air is not same,
 - (4) The liquid air and gaseous air are not pure substances.

第二篇短文:

Mechanical engineers are capable of making things, tools, and machines to produce various products. It needs extensive knowledge which may include engineering mathematics, mechanics of solids, fluid dynamics, thermal science, mass and momentum transport, manufacturing processes, and control technique.

To design a gear box used in a machine usually involves mechanics, strength of material, mechanism, fluid dynamics, heat transfer, material selection, machining, automation technique, measurement, inspection, and so on. The development of internal combustion engine for cars involves more fundamental science and technology, such as thermodynamics, combustion, fluid dynamics, machine design, vibration, sound, control, manufacturing and system engineering.

5. The scope of mechanical engineers can handle?
- (1) Analyze the temperature distribution of an internal combustion engine,
 - (2) Make tools to produce automotive parts,
 - (3) Develop automation technique to assemble internal combustion engine,
 - (4) All above are correct.
6. The power transmission using gear box does NOT involve following knowledge?
- (1) Strength of material,
 - (2) Fluid dynamics,
 - (3) Combustion,
 - (4) Material selection.
7. When we develop a new internal combustion engines, which group of fundamental expertise has a higher priority need?
- (1) Use bolt screws to assemble the engine cover and engine block together,
 - (2) Measuring engine efficiency,
 - (3) Thermodynamics, combustion and machine design,
 - (4) Design robot arms to assemble the engine.
8. Mechanical engineers (MEs) often are responsible for system integration. Which is

NOT a correct statement?

- (1) MEs have extensive expertise in machine design and manufacturing,
- (2) MEs have broad expertise in combustion in automobile technology,
- (3) MEs have expertise in both bio-science and chemical chain reaction,
- (4) MEs may have skill to develop optical disk drive.

第三篇短文:

The woodworking machinery industry in Taiwan has developed for almost six decades with the beginning as a re-sell agent for European, American and Japanese models. Now over 80% content in average of its woodworking machinery is locally made. MIT (made in Taiwan) woodworking machinery last year saw annual export value surge to a six year high, with a 15.4% increase on the previous year with record high sales of USD \$585 million. The industry range covers from sawing, planing, boring, finger-jointing, sanding, polishing machinery to portable tools, blades and CNC (computer numerical controlled) machines.

Wood Taiwan 2015 will serve as the industry's leading woodworking machinery procurement platform when it unfolds July 2nd to 5th at NANGANG Exhibition Hall to join 200 leading domestic and foreign exhibitors who are using 1,200 booths. Top exhibit highlights are CNC routers, woodworking tools, rip saws, double-sided thickness planers, CNC boring machines, panel saws, sander machines, edge banding machines, and polishing machines.

For pre-registration and other details on Wood Taiwan 2015, click:
www.woodtaiwan.com

9. The woodworking machinery industry in Taiwan is

- (1) An old traditional industry with long history,
- (2) An industry sells foreign woodworking machines and makes its own machines,
- (3) It is making good progress with a positive revenue growth,
- (4) Above are all correct.

10. What is the role of Wood Taiwan 2015?

- (1) It is an exhibition platform allows woodworking machine saw woods,
- (2) It is a platform for solely education purpose,
- (3) It is a show of woodworking machineries,
- (4) Difficult to estimate.

11. What covering from sawing, planing, boring, finger-jointing, veneering, sanding, to polishing machinery is about?

- (1) The platform of woodworking devices,
- (2) The machines re-sold in Taiwan,

- (3) The different function or types of woodworking machinery,
 - (4) The machines with different brand names.
12. The top exhibit highlights in Wood Taiwan 2015 means
- (1) The top in Wood Taiwan 2015,
 - (2) The top exhibition will be shown in the Wood Taiwan 2015,
 - (3) The most advanced woodworking machines will be shown in the exhibition,
 - (4) The sell price will be discounted in the Wood Taiwan 2015.

第二部份：翻譯題(英翻中試題)，請翻譯英文為中文

(共 2 題, 每題 20 分, 共 40 分)

1. It takes different amount of energy to raise the temperature of identical mass of different substances by one degree. For example, it needs about 4.5 KJ of energy to raise the temperature of 1 kg of iron from 20 to 30°C, whereas it takes about 9 times this energy (41.8 KJ to be exact) to raise the temperature of 1 kg of liquid water by the same amount. Therefore, a material property that can compare the energy storage capability of various substances is called the specific heat. The specific heat is defined as the energy required raising the temperature of a unit mass of a substance by one degree. In general, the energy will depend on how the process is executed. In thermodynamics, there are two kinds of specific heat: specific heat at constant volume and specific heat at constant pressure.

2. Automotive suspension mechanisms must allow controlled, single-degree-of-freedom motion of the wheel axis relative to the body of the vehicle. It is necessary for the suspension mechanism to maintain the plane of the wheel as perpendicular as possible to the ground at all times. This is because automobile tires are designed to develop maximum lateral force when they are in the upright position, as opposed to motorcycle tires, which must function in inclined positions during hard cornering. Since the center of mass of an automobile vehicle is always higher than the wheel axes, there is a tendency for the body to roll toward the outside of a turn.