

# 國立中山大學 102 學年度碩士暨碩士專班招生考試試題

科目名稱：科技英文【機電系碩士班乙組】

題號：438004

※本科目依簡章規定「不可以」使用計算機

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1. 50% The limit of total words for the following two problems is 200 words. Please answer in English and write on the answering sheets. There are no points, if answer in Chinese.

A. 25%

Please write in English (a) to plot the conventional and true stress-strain diagrams for ductile material (mild steel) ( not to scale) and mark the feature points in stress and strain axes 5%,(b) to describe and explain how to obtain these diagrams 10% and (c) to state the difference between conventional and true stress-strain diagrams 10%.

B. 25%

Please write in English (a) to state clearly under what two conditions is the principle of superposition to be applied validly 10% and (b) why the torsion formula in Mechanics of Materials can only be applied to the solid and tubular shafts, i.e., can't be applied to noncircular cross-sections 5% and (c) for what purposes do we need to plot the shear and moment diagrams 10%?

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## 2. (Total: 50%)

Please completely fill out the following crossword puzzle.

1. [2%]

As vector quantity which is the length of the shortest path connecting the point where a body starts to move and the point where the body finally reaches.

2. [2%]

If the total kinetic energy of a system conserves in a collision, the collision is said to be [ ]. It is a physical property of materials which return to their original shape after they are deformed.

3. [2%]

When an object is acted on by more than one force, the combined force that causes the object to accelerate is referred to [ ] force.

4. [2%]

It arises whenever an object slides or tends to slide over another object.

5. [2%]

[ ] = force in the direction of displacement x displacement

6. [2%]

The tendency of a body to maintain its state of rest or constant speed along a straight line.

7. [2%]

A [ ] diagram shows all the forces acting on an object.

8. [2%]

The [ ] in a string is called tension.

9. [2%]

The rate at which energy is transferred or work is done.

10. [2%]

When an object's speed increases, its [ ] energy increases as well.

11. [2%]

The rate of change in position (or displacement).

12. [2%]

The length of the path you traveled.

13. [2%]

When you lift a box up, the box will gain gravitational [ ] energy.

14. [4%]

$m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$ ; this is the formula for the law of [ ] of [ ]

15. [2%]

The resistance or inertia to change a body's state of rest or uniform motion is positively related to the body's [ ]

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16. [2%]

The scientist who proposed the three laws of motion; his name is adopted as the unit of force.

17. [2%]

Without other force, an object that is thrown in the air falls because it is under the [     ] of the Earth.

18. [2%]

Overall displacement over total time taken is equal to [     ] velocity.

19. [2%]

During free fall, an object attains the [     ] speed when it stops accelerating and falls with a constant speed.

20. [2%]

The quantity that requires both magnitude and direction for a complete description.

21. [2%]

The quantity that can be described by magnitude only.

22. [2%]

The rate of change of velocity.

23. [2%]

The SI unit for speed.

24. [2%]

The runway is said to be friction-[     ] if a trolley moves down it at a constant speed when given a sharp push.

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