UCD School of Mechanical and Materials Engineering
MEEN10060 Design and Materials
2012 MCQ Test

SAMPLE - TEST FORMAT & QUESTIONS

INSTRUCTIONS TO CANDIDATES:

1) Answer all questions.
2) Each correct answer will be awarded 4 marks.
3) Each incorrect answer will result in a mark being deducted.
4) To select your answer, check the box with a clear 'x' as follows: ☒
5) Return your answers on using on your question sheet.
6) The time for the examination will be 35 mins.
7) No candidates will be allowed to leave the examination venue until the examination has concluded.
8) Return all rough work using the supplied sheets.

Student Name (Surname, Forename(s)):_____

Student ID No: _____

SAMPLE QUESTIONS.

1: What is the minimum number of phases that must be present in a composite material?

a) 2. ☐
b) 0. ☐
c) 1. ☐
d) 3. ☐

2: An alloy of iron and carbon with up to 1.4 wt.% carbon is known as:

a) Steel ☐
b) Non-ferrous alloy ☐
c) Cast iron ☐
d) Graphite ☐

3: The symbol normally used for Engineering Strain is:

a) σ ☐
b) θ ☐
c) ε ☐
d) E ☐

4: If, during a tensile test, a sample is stretched to a final length of 15 mm from an initial length of 10 mm, what is the value of strain that is experienced by the sample?

a) 15 ☐

b) 1.5 ☐

c) 0.15 ☐

d) 0.5 ☐

5: For the tensile-test result given as curve A given in Figure 1, the quantity defined at Point 3 is:

a) Strain to failure ☐

b) Yield stress ☐

c) Modulus of elasticity ☐

d) Ultimate tensile stress ☐

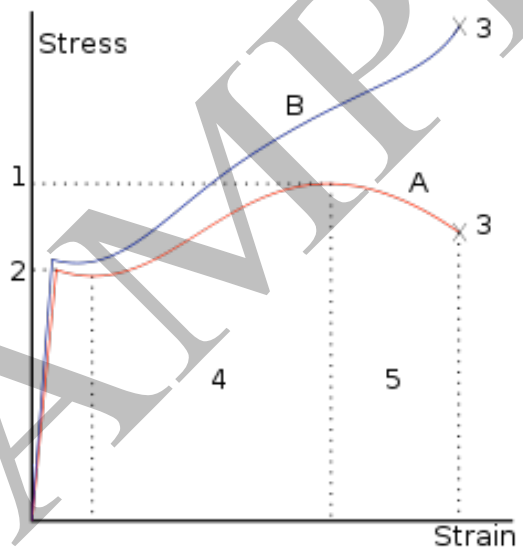

Figure 1

6: A metal that consists of iron with 0.6 – 1.4 wt.% carbon added is known as

a) An austenitic steel ☐

b) High-carbon steel ☐

c) Low-carbon steel ☐

d) Inconel ☐

7: The Design Process is NOT:

a) A process of goal-directed reasoning, reducing the problem to a set of solutions. ☐

b) A creative process, guided by a structured approach, with no guaranteed output. ☐

c) Heavily reliant on project and people management. ☐

d) A process best carried out by an individual, with limited contribution from others. ☐

8: As given by Dieter & Schmidt, the 4 C's of Design do **NOT** include:

a) Creativity ☐

b) Complexity ☐

c) Choice ☐

d) Cost ☐

9: The Modulus of Elasticity (E) for MDF is typically of the order of:

a) 4 GPa ☐

b) 10 MPa ☐

c) 4 kPa ☐

d) 40 GPa ☐

10: In a simply supported beam, the stress (σ) due to an applied bending moment M is proportional to the Area Moment of Inertia (I). The relationship is shown as:

A) σ α I ☐

B) σ α 1 / I ☐

C) σ α 1 / I^2 ☐

D) σ α I^2 ☐

----------Rough Work----------