Practice quiz: ASNT NDT Level II, Magnetic Particle Testing (MT) General exam

5 questions. The answer key is on page 2.

Name _____ Date _____

1. **As a steel is driven closer to saturation, what happens to the extra flux density gained for each added unit of magnetizing force?**
   A. It falls to near that of air
   B. It rises to its largest value
   C. It stays exactly constant
   D. It reverses and becomes negative

2. **The same DC is passed through a steel tube and a solid steel bar with the same outside diameter. How does the field at the tube's outside surface compare?**
   A. About half that of the solid bar
   B. About the same as the solid bar's
   C. About twice as strong as the solid bar
   D. Zero, the same as at the tube's bore

3. **A technician uses a DC yoke instead of an AC yoke on a smooth plate to look for fine surface cracks. Compared with the AC yoke, what is the usual drawback?**
   A. The field reaches less deeply into the part, so subsurface flaws become harder to detect
   B. The poles must be set farther apart, so the area covered by each shot is smaller
   C. Particles move less on the surface, so the smallest surface flaws are harder to show
   D. The yoke heats the part surface, so arc strikes are more likely at each pole

4. **Which combination of conditions is needed for stress-corrosion cracking?**
   A. Cyclic stress, a hardened surface and a sharp notch at a thread root
   B. Compressive stress, a soft material and a dry, clean environment
   C. Rapid cooling, high hardness and hydrogen from damp electrodes
   D. Tensile stress, a susceptible material and a corrosive environment

5. **A sharp line of particles follows the fusion line of a weld joining carbon steel to austenitic stainless steel. Which check best separates a surface crack from a permeability boundary?**
   A. A second MT shot at a higher current level
   B. Liquid penetrant testing of the same area
   C. A field indicator held on the fusion line
   D. Dry powder in place of the wet particles

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Answer key

ASNT NDT Level II, Magnetic Particle Testing (MT) General exam. One line of why for each answer.

1. **A** Near saturation almost all domains are already aligned, so each added unit of H adds only about as much B as it would in air; the incremental permeability falls toward that of air.
2. **B** At the outside surface H = I / (2 pi r) depends only on the current and the outside radius, so the tube and the solid bar have about the same surface field.
3. **C** AC gives a field concentrated near the surface and its alternation helps particles move toward leakage fields, so it usually shows fine surface cracks better than DC.
4. **D** Stress-corrosion cracking needs sustained tensile stress, a material susceptible to it and a specific corrosive environment together; remove any one and it stops.
5. **B** Penetrant responds only to openings at the surface and ignores magnetic properties, so a crack shows and a permeability boundary does not.

Full explanations

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