

Questions and Answers

Levels I, II, and III

Visual and Optical Testing Method

Supplement to
Recommended Practice
No. SNT-TC-1A
Book I



**The American Society
for Nondestructive Testing, Inc.**

This publication contains suggested questions and answers in the visual and optical testing method for use in conjunction with *Recommended Practice No. SNT-TC-1A*, available from ASNT.

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ASNT exists to create a safer world by promoting the profession and technologies of nondestructive testing.

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Recommended Training References

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The following references were used in formulating the questions contained in this book.

- A.* *ASM Handbook*, ninth edition, Volume 17, *Nondestructive Evaluation and Quality Control*, Metals Park, OH: ASM International, 1989.
- B. *Hobart Institute of Welding Technology Welding Guide*, Troy, OH, Hobart Institute of Welding Technology, 1995.
- C.* *Nondestructive Testing Handbook*, first edition, Robert C. McMaster, ed. Columbus, OH, The American Society for Nondestructive Testing, Inc., 1959.
- D. *Visual Examination Technology: Competency Area 101 (Level I) Practical/Specific*, Charlotte, NC, EPRI NDE Center, December, 1996.
- E.* *Nondestructive Testing Handbook*, second edition: Volume 8, *Visual and Optical Testing*, Michael Allgaier, Stanley Ness, technical eds., Paul McIntire and Patrick O. Moore, eds., Columbus, OH, The American Society for Nondestructive Testing, Inc., 1993.
- F. *Visual Examination Technology: Competency Area 102 (Level II) General*, Charlotte, NC, EPRI NDE Center, December, 1996.
- G. *Welding Handbook: Welding Technology*, Volume 1, eighth edition, Miami, FL, American Welding Society, 1987.

* Available from The American Society for Nondestructive Testing, Inc.

Each question found in this book contains bold letter(s) and page number(s) immediately following the answers. For example,

6. A discontinuity associated with metal overflow during forging is called a:
- a.seam.
 - b.flake.
 - c.lap.
 - d.lamination.

A.493

In this example, the letter "A" refers to Reference A in the list provided above and "493" is the specific page range in Reference A where the answer to the question can be found. Always select the "most correct" answer.

Reference Usage List

Reference A: Total = 8

Level I (4)

Level II (4)

Level III (0)

Reference B: Total = 2

Level I (0)

Level II (2)

Level III (0)

Reference C: Total = 7

Level I (4)

Level II (3)

Level III (0)

Reference D: Total = 40

Level I (29)

Level II (11)

Level III (0)

Reference E: Total = 168

Level I (39)

Level II (44)

Level III (85)

Reference F: Total = 32

Level I (7)

Level II (26)

Level III (0)

Reference G: Total = 27

Level I (5)

Level II (22)

Level III (0)

Level I Questions

Visual and Optical Testing Method

1. Steel mill products may have:
 - a. stress cracks.
 - b. die burns.
 - c. arc drags.
 - d. laminations.

A.549
2. A high-intensity source of light may cause an inspection problem because:
 - a. it produces excessive glare.
 - b. it produces considerable heat.
 - c. it has a short bulb life.
 - d. the lamp head cannot be adjusted.

E.54-55
3. A common inspection instrument that is used to visually inspect internal bore surfaces is a:
 - a. magnifying glass.
 - b. borescope.
 - c. phototube.
 - d. microscope.

C.11-12
4. Glare can be reduced on an inspection surface by using:
 - a. visible light.
 - b. spectral light.
 - c. screens.
 - d. polarized light.

C.10-3
5. A discontinuity associated with metal overflow during forging is called a:
 - a. seam.
 - b. flake.
 - c. lap.
 - d. lamination.

A.493
6. A jagged, nonintegrally bonded piece of metal that leaves a depression in another metal after it is removed, is called a:
 - a. seam.
 - b. blister.
 - c. scab.
 - d. gouge.

A.549 and 568
7. The physical characteristics of color are:
 - a. hue, purity, and brightness.
 - b. wavelength, spectrum, and contrast.
 - c. acuity, perception, and distance.
 - d. none of the above.

C.10-2
8. When scale is partially rolled into the surface of a steel plate it is called:
 - a. scabs.
 - b. rolled-in-scale.
 - c. pits.
 - d. tears.

E.226
9. A valve that provides linear motion during operation is called:
 - a. a gate valve.
 - b. a ball valve.
 - c. a butterfly valve.
 - d. all of the above.

D.3PS:4/20
10. An attachment to a component that is welded, cast, or forged is called:
 - a. a nonintegral attachment.
 - b. an integral attachment.
 - c. a restraint.
 - d. a clamp.

D.5PS:5/27

Visual and Optical Testing Method, Level I

11. Devices that restrict the movement of hanger springs and prevent damage during installation are called:

- a. clips.
- b. travel stops.
- c. shims.
- d. grout.

D.6PS:16/19

12. The combined static and friction head (vertical difference in elevation) is called:

- a. pump head.
- b. total head.
- c. brake horse power.
- d. maximum head.

D.4PS:10/12

13. Wear due to erosion/corrosion on a valve is typically found in:

- a. the valve body.
- b. the valve seating area.
- c. the valve disk.
- d. all of the above.

D.3PS

14. Which of the following is a type of component support?

- a. Plate and shell.
- b. Linear.
- c. Component support standards.
- d. All of the above.

D.5PS:8/27

15. A valve is a mechanical device that:

- a. moves fluids or gases.
- b. controls flow.
- c. is rarely used in a nuclear power plant.
- d. is always welded into a system.

D.3PS:3/20

16. Devices that limit or allow no motion in one or more directions are called:

- a. hangers.
- b. supports.
- c. restraints.
- d. clamps.

D.5PS:8/27

17. Bolting failures typically occur at:

- a. the thread root area.
- b. the head to shank area.
- c. nicks or gouges.
- d. all of the above.

D.2PS

18. The two major categories of pumps are:

- a. static and friction head.
- b. dynamic and displacement.
- c. single stage and multi-stage.
- d. turbine and condensate.

D.4PS:7/12

19. A mechanical device that raises, transfers, or pressurizes fluids is:

- a. a valve.
- b. a snubber.
- c. an electric motor.
- d. a pump.

D.4PS:3/12

20. A discontinuity that is not associated with welds is:

- a. undercut.
- b. overlap.
- c. laminations.
- d. underfill.

D.1PS:7/10

21. During an examination of a groove weld, which of the following dimensions is normally measured?

- a. The root opening.
- b. Weld reinforcement.
- c. Base material thickness.
- d. All of the above.

D.1PS:6/10

22. A welding symbol over the reference line refers to:

- a. the area on the arrow side.
- b. the area near the end of the arrow.
- c. the area opposite of the arrow.
- d. a field weld.

D.1PS:4/10

23. A valve that uses linear motion, which is used to regulate flow, is called a:

- a. butterfly valve.
- b. globe valve.
- c. swing check valve.
- d. ball valve.

D.3PS:4/20

24. A device that restricts movement during an abnormal or seismic event is called a:

- a. restraint.
- b. snubber.
- c. hanger.
- d. support.

D.5PS:8/27

25. A centrifugal pump is classified as:

- a. a dynamic pump.
- b. a reciprocating pump.
- c. a displacement pump.
- d. all of the above.

D.4PS:7/12

26. The device in a pump that moves or compresses fluid is called:

- a. a pump casing.
- b. a packing gland.
- c. a disk.
- d. an impeller.

D.4PS:8/12

27. The closure element of a diaphragm valve is called:

- a. the weir.
- b. a flexible elastomer.
- c. the bonnet.
- d. the disk.

D.3PS:15/20

28. Component supports are divided into groups. Which of the following is not considered to be a group of component supports?

- a. Hangers.
- b. Supports.
- c. Integral attachments.
- d. Snubbers.

D.5PS:5/27

29. During a visual examination, a welding discontinuity that could not be detected would be:

- a. undercut.
- b. underfill.
- c. cracks.
- d. side wall lack of fusion.

D.1PS:7/10

30. For component supports, the principal movement axis is:

- a. the horizontal axis.
- b. the vertical axis.
- c. the longitudinal axis.
- d. all of the above.

D.5PS:4/27

31. A device that is typically installed vertically with the support member in tension is called a:

- a. support.
- b. restraint.
- c. snubber.
- d. hanger.

D.5PS:6/27

32. A valve subassembly that is considered to be part of the pressure vessel assembly is called the:

- a. drive.
- b. stem.
- c. body.
- d. disk.

D.3PS:6/20

33. A device that raises, transfers, or pressurizes fluids by pressing, forcing, or throwing the fluid through apertures or pipes is called a:

- a. valve.
- b. pump.
- c. snubber.
- d. bolt.

D.4PS:3/12

34. Valves that use rotational motion to make a seal are called:

- a. ball valves.
- b. gate valves.
- c. globe valves.
- d. all of the above.

D.3PS:16/20

35. Service-induced discontinuities can be the result of:

- a. vibration.
- b. stress risers.
- c. corrosion.
- d. all of the above.

D.2PS:9/15

36. A device that is typically installed vertically with the support member in compression is called a:

- a. support.
- b. hanger.
- c. snubber.
- d. spring can.

D.5PS:7/27

37. Typical reportable discontinuities for component supports include:

- a. drawing anomalies.
- b. workmanship.
- c. operational.
- d. all of the above.

D.8PS:12/21

Visual and Optical Testing Method, Level I

38. A physical attribute that cannot be visually inspected during welding is:
- the welding process.
 - the acceptability of the weld, with regard to its appearance.
 - alignment and fit-up.
 - joint preparation.
- A.469 F.4G:10/11
39. An inherent discontinuity in forgings that cannot be detected using visual testing is:
- bursts.
 - cracks.
 - seams.
 - laps.
- E.274-275; F.4G:5/11 G.368
40. Every inspector is affected differently by perception, fatigue, and attitude. In visual inspection, these factors are classified as:
- physiological factors.
 - uncontrolled factors.
 - production factors.
 - classic distress factors.
- E.57-62 F.6G:14/18
41. To examine areas around bends inside a pipe section, the visual examiner uses a:
- telescope.
 - fiberoptic borescope.
 - borescope.
 - microscope.
- F.3G:8/19 F.6G
42. On a thickness gage, twenty thousandths of an inch is represented by:
- 0.2
 - 0.02
 - 0.002
 - 0.0002
43. In a casting, a visual examiner could expect to find:
- laminations.
 - stringers.
 - bursts.
 - hot tears.
- E.276 E.7G
44. Porosity is:
- material used during the welding process.
 - gas entrapped below the surface of a material.
 - gas entrapped below or at the surface of a material.
 - foreign crystallized material entrapped below the surface of a material.
45. A visual examiner could expect to find a crater crack:
- at the beginning of the weld.
 - somewhere between the beginning and the end of the weld.
 - at either the beginning or the end of the weld.
 - at the end of the weld.
46. A discontinuity with a small star-shaped pattern where a weld starts or stops is usually an indication of:
- surface porosity.
 - undercut.
 - a crater crack.
 - slag.
- F.6G:14/18 F.6G
47. During the visual examination of a full penetration double bevel weld joint, visual examination cannot locate:
- undercut.
 - underfill.
 - crater cracks.
 - insufficient penetration.
48. The initiation of a fatigue crack could occur at:
- weld toes.
 - notches.
 - section changes.
 - thread roots.
 - all of the above.
- E.7G G.241 and 261
49. A welding discontinuity typically referred to as distortion is caused by:
- the use of a tungsten electrode in the GTAW welding process.
 - the uncontrolled heating and cooling of the weld metal.
 - exposure to radiation and other NDE techniques.
 - the excess amount of porosity in the weld metal.

50. When measuring plate thickness, the most accurate reading is given by a:
- steel ruler.
 - steel tape.
 - mechanical gage (micrometer).
 - feeler gage.
- E.3G:17/19**
51. When choosing a magnifier, major consideration should be given to:
- power or magnification.
 - working distance.
 - field of view.
 - all of the above.
- C.11-1**
52. Visual inspection is the most extensively used inspection method on weldments because:
- it is simple and relatively inexpensive.
 - it does not normally require special equipment.
 - it gives important information about conformity to specifications.
 - all of the above.
- G.469**
53. In order to render valid results, visual examination must include a:
- trained operator.
 - procedure for conducting the tests.
 - standard for interpreting and reporting the results.
 - all of the above.
- G.469**
54. The maximum diameter of a borescope that can be used for the test is determined by:
- object depth.
 - entry port size.
 - objective distance.
 - direction of view.
- E.74-75**
55. A device that provides the means for comparing a test surface to a standard surface finish is called a:
- measuring magnifier.
 - surface calibrator.
 - surface comparator.
 - surface magnifier.
- E.76-81**
56. An instrument that can be equipped with forward oblique, right angle, or retrospective visual systems is called:
- an angulated borescope.
 - a microscope.
 - a panoramic borescope.
 - a stereoscope.
- E.82-91**
57. The use of chemical solutions to attack material surfaces in order to improve the visibility of discontinuities for visual inspection at normal and low power magnification is called:
- microetching.
 - macroetching.
 - replication.
 - vibroetching.
- E.118-123**
58. A "charged coupled device chip" is used with:
- a fiberoptic borescope.
 - an angulated borescope.
 - a video imaging device.
 - a profile gage.
- E.128-130**
59. Cracks, suckback, undercut, and overlap are discontinuities found in:
- castings.
 - forgings.
 - extrusions.
 - weldments.
- E.128-130**
60. In welding, weld metal protrusion beyond the fusion line at the weld toe is called:
- overlap.
 - undercut.
 - reinforcement.
 - incomplete fusion.
- E.163-175**
61. In accordance with *SNT-TC-1A*, certification of visual NDT personnel is the responsibility of:
- ASNT.
 - the employer.
 - the NDT Level III.
 - an outside agency.
- E.181-187**