

**ATLANTIS NDT**

Liquid Penetrant Testing (PT) Level II

Specific Examination — Practice Questions

20 multiple-choice questions with an answer key and explanations

Candidate name	
Date	
Time allowed (suggested)	60 minutes
Score	____ / 20

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Before you start

Written against the documents named below; check the edition your written practice and contract name. The questions test applying an Article 6 procedure and the acceptance criteria a PT Level II most often works to on US pressure vessels and process piping.

Documents these questions are written against: ASME BPVC Section V, Article 6 (2023 edition); ASME BPVC Section VIII, Division 1, Mandatory Appendix 8 (2023 edition); ASME B31.3 Process Piping (2022 edition). Your employer's written practice and the contract decide which edition applies; if yours differs, check the answer against your edition.

Choose the single best answer for each question. Work without notes first, then check yourself against the answer key at the back. Under ASNT SNT-TC-1A your employer's written practice sets the passing grade and the number of questions in the real examination.

These are original study questions written by Atlantis NDT. They are not taken from, and do not reproduce, any ASNT or employer examination.

1. A written procedure qualified under ASME Section V Article 6 specifies a minimum penetrant dwell of 15 minutes on welds. Production asks to use 10 minutes. How must this change be handled?

- A. As a nonessential change that only needs a note on the examination report
- B. As no change at all, because 10 minutes still exceeds the Article 6 table minimum for welds
- C. As an essential-variable change requiring revision and, where required, requalification
- D. As acceptable without revision if the development time is increased by 5 minutes

2. A qualified Article 6 procedure is changed only to add a different post-examination cleaning method. Which statement is correct?

- A. Nonessential: revise the procedure or add an addendum; no requalification is needed
- B. It is an essential variable, so the procedure must be requalified by demonstration
- C. No action is needed, because post-cleaning takes place after the examination is complete
- D. The change is allowed only if the Authorized Inspector witnesses a new demonstration

3. A carbon steel weld must be examined when its surface is at 30 °F (–1 °C). The procedure covers only the standard Article 6 temperature range. What is an acceptable course of action?

- A. Proceed, but double the penetrant dwell time to compensate for the slower penetration
- B. Proceed, provided the penetrant cans have been kept at room temperature so the liquid stays thin
- C. Proceed using dry developer, which is not affected by the low part temperature
- D. Warm the area locally so the part stays within 40–125 °F (5–52 °C) throughout the examination

4. Using the minimum dwell times in Article 6 (no qualified alternative), a weld is examined with its surface at 45 °F (7 °C). What is the minimum penetrant dwell time?

- A. 5 minutes
- B. 10 minutes
- C. 15 minutes
- D. 20 minutes

5. Nonaqueous developer is sprayed on at 10:00 and the coating is dry at 10:03. With no alternative qualified, when may final interpretation be made?

- A. Between 10:00 and 10:30
- B. Between 10:10 and 11:00
- C. Between 10:13 and 11:03
- D. At any time after 10:03

6. Under Article 6 alone, for which material is certification of the contaminant content of the penetrant materials NOT required?

- A. Alloy 625 (nickel-base) weld overlay
- B. SA-516 Grade 70 carbon steel plate
- C. Type 316L austenitic stainless steel pipe
- D. Grade 2 titanium tube

7. You are about to examine Type 304 stainless steel welds. The batch number on your penetrant can does not appear on any contaminant certification you hold. What should you do?

- A. Use it, because the same product name appears on a certification
- B. Use it, and post-clean the welds thoroughly afterward
- C. Use it, provided the can is still within its shelf life
- D. Do not use that can until certification for that batch is obtained

8. A color contrast examination of a weld gave a doubtful result. The client asks you to re-examine the same area with a fluorescent penetrant for higher sensitivity. Under Article 6:

- A. Not permitted; a fluorescent examination shall not follow a color contrast one
- B. Permitted once the area has been wiped clean with solvent
- C. Permitted if both penetrants come from the same manufacturer
- D. Required, because a fluorescent penetrant is more sensitive than visible dye

9. Before examination, Article 6 requires the surface to be examined and the adjacent area to be dry and free of dirt, grease, scale, spatter, paint and similar matter. How far must the adjacent area extend as a minimum?

- A. 1/2 in. (13 mm)
- B. 1 in. (25 mm)
- C. 2 in. (50 mm)
- D. 6 in. (150 mm)

10. Water-washable penetrant is being removed with a water spray at 60 psi (414 kPa) and 100 °F (38 °C). Does this meet Article 6?

- A. Yes; both values are within the Article 6 limits
- B. Yes, provided a coarse spray nozzle is used
- C. No; the water temperature exceeds the Article 6 limit
- D. No; the water pressure exceeds the 50 psi (350 kPa) limit

11. Which developer may NOT be used with a color contrast (visible) penetrant under Article 6?

- A. Nonaqueous (solvent-suspended) developer
- B. Aqueous suspendable developer
- C. Dry powder developer
- D. None; any developer form may be used

12. Before evaluating a visible-dye examination, a white-light meter at the examination surface reads 80 fc (861 lx). What is the correct decision under Article 6?

- A. Not acceptable; raise the light to at least 100 fc (1,076 lx) at the surface
- B. Acceptable; the Article 6 minimum for visible-dye evaluation is 50 fc (538 lx)
- C. Acceptable, because natural daylight is available on site
- D. Not acceptable; the minimum is 200 fc (2,152 lx)

13. A fluorescent examination series begins with a UV-A reading of 1,350 $\mu\text{W}/\text{cm}^2$ at the surface. The reading at the end of the series is 820 $\mu\text{W}/\text{cm}^2$. What is the most defensible action?

- A. Accept the results, since the opening reading met the requirement with margin to spare
- B. Average the two readings (about 1,085 $\mu\text{W}/\text{cm}^2$) and accept the results
- C. Re-examine the work done since the last acceptable reading, at 1,000 $\mu\text{W}/\text{cm}^2$ or more
- D. Record the low reading and lower the procedure minimum to 800 $\mu\text{W}/\text{cm}^2$

14. A UV-A radiometer was last calibrated 14 months ago and has been in storage since. Under Article 6, can it be used today?

- A. Yes, because it has not been used since it was calibrated
- B. Yes, provided it agrees with a second meter in the shop
- C. No; it must be replaced, because calibrated meters expire after 12 months
- D. No; it must be calibrated first, as the annual calibration has lapsed

15. An indication is found to be rejectable. As a minimum, what does Article 6 require to be recorded for it?

- A. Its type (linear or rounded), location and extent
- B. Only the weld number and the word 'reject' on the summary sheet
- C. A photograph of the developed indication with a scale in view
- D. Its estimated depth below the surface and its length

16. Under ASME VIII Division 1 Mandatory Appendix 8, an isolated indication measures 3/32 in. (2.4 mm) long and 1/32 in. (0.8 mm) wide. What is the correct evaluation?

- A. Rejectable, because it is a relevant linear indication over 1/16 in. (1.5 mm)
- B. Not relevant, because its width is below 1/16 in. (1.5 mm)
- C. Rejectable, because every relevant rounded indication is rejectable
- D. Acceptable: it is a relevant rounded indication not over 3/16 in. (5 mm)

17. Under Appendix 8, four rounded indications, each about 3/32 in. (2.4 mm) in diameter, lie in a straight line with about 1/32 in. (0.8 mm) between adjacent edges. What is the evaluation?

- A. Acceptable, because each indication is under 3/16 in. (5 mm)
- B. Rejectable: four or more in line, 1/16 in. (1.5 mm) or less apart edge to edge
- C. Acceptable, because the in-line rule applies only to linear indications
- D. Not relevant, because rounded indications under 1/8 in. (3 mm) are disregarded

18. Under Appendix 8, an examiner believes an indication at a weld toe is nonrelevant and caused by surface geometry. How must it be treated?

- A. Recorded as nonrelevant on the examiner's judgment alone
- B. Ignored if it is shorter than 3/16 in. (5 mm)
- C. Regarded as an imperfection until re-examination shows otherwise
- D. Accepted if a second qualified Level II examines it visually and agrees

19. Random liquid penetrant examination specified by the engineering design for a Normal Fluid Service piping system reveals a crack in a fillet weld. The weld is ground out and rewelded. How must the repair be examined under ASME B31.3?

- A. Visually only, because the repaired length is short and the crack has been removed
- B. By the same methods, extent and acceptance criteria as the original weld
- C. By radiography, which replaces the original method for all repairs
- D. Not at all, provided the welder holds a current qualification

20. Random PT specified by the engineering design for a B31.3 piping system finds a defect in one weld made by Welder W. Under progressive sampling, what is the next step besides repairing the defective weld?

- A. Examine two more of Welder W's welds of the same kind, by the same method
- B. Examine every weld Welder W has made on the project
- C. Examine one additional weld of the same kind made by any welder on the system
- D. Nothing further; repairing the defective weld closes the matter

Answer key and explanations

1. C	2. A	3. D	4. B	5. C	6. B	7. D	8. A	9. B	10. D
11. C	12. A	13. C	14. D	15. A	16. D	17. B	18. C	19. B	20. A

1. C — Article 6 lists a decrease in penetrant dwell time as an essential variable. Every change from the written procedure needs a revision or addendum, and where the referencing Code requires qualification an essential-variable change also needs requalification by demonstration; the table minimum does not override the written procedure. [ASME BPVC Section V, Article 6 (2023)]

2. A — Article 6 lists the post-examination cleaning technique as a nonessential variable, so changing it does not require requalification. Article 6 still requires every change, essential or nonessential, to be made by revising the written procedure or issuing an addendum. [ASME BPVC Section V, Article 6 (2023)]

3. D — Article 6 permits local heating or cooling provided the part stays within the standard range throughout the examination. Below 40 °F the procedure must be qualified at the proposed temperature, for example with a comparator block; a doubled dwell applies only from 40 °F up to 50 °F (5–10 °C) and is not a license to work colder. [ASME BPVC Section V, Article 6 (2023)]

4. B — Table T-672 gives 5 minutes for welds in the 50–125 °F (10–52 °C) range and requires twice the listed penetrant dwell from 40 °F up to 50 °F (5–10 °C): $2 \times 5 = 10$ minutes. Twenty minutes would be the doubled value for wrought products such as forgings, which are listed at 10 minutes. [ASME BPVC Section V, Article 6 (2023), Table T-672]

5. C — Article 6 starts the developing time when a wet developer coating is dry (10:03), and final interpretation is made not less than 10 nor more than 60 minutes after that: 10:13 to 11:03. Longer periods are allowed only if bleed-out does not alter the results, and a surface too large to finish within the window is examined in increments. [ASME BPVC Section V, Article 6 (2023)]

6. B — Article 6 requires contaminant certification for penetrant materials used on nickel-base alloys (sulfur), austenitic or duplex stainless steels and titanium (halogens). Carbon steel is not on that list, although a client specification may still call for low-contaminant materials. [ASME BPVC Section V, Article 6 (2023)]

7. D — Article 6 certifications must include the manufacturer's batch numbers and the test results, so they cover specific batches, not a product name. Without one, the batch cannot be shown to meet the halogen limits for austenitic stainless steel, and post-cleaning does not cure that. [ASME BPVC Section V, Article 6 (2023)]

8. A — Visible dye left in the discontinuity can suppress the fluorescence of the second penetrant, so Article 6 prohibits a fluorescent examination after a color contrast one. A doubtful indication is resolved by re-examination as the procedure allows or by another method. [ASME BPVC Section V, Article 6 (2023)]

9. B — Article 6 requires the examination surface and all adjacent areas within at least 1 in. (25 mm) to be clean and dry. Contamination next to the area can be carried into it and mask or mimic indications. [ASME BPVC Section V, Article 6 (2023)]

10. D — Article 6 limits the rinse to 50 psi (350 kPa) and 110 °F (43 °C). The temperature here is acceptable, but the pressure is too high and can wash penetrant out of discontinuities. [ASME BPVC Section V, Article 6 (2023)]

11. C — Article 6 permits only wet developer with color contrast penetrants, since dry powder does not form the uniform white coating that red indications need. With fluorescent penetrants, either wet or dry developer may be used. [ASME BPVC Section V, Article 6 (2023)]

12. A — Article 6 requires at least 100 fc (1,076 lx) of natural or supplemental white light at the examination surface for evaluating color contrast indications, measured with a white-light meter or provided by a verified light source. 80 fc falls short, so the lighting is improved before evaluation. [ASME BPVC Section V, Article 6 (2023)]
13. C — Article 6 requires at least 1,000 $\mu\text{W}/\text{cm}^2$ at the surface and requires the intensity to be measured before use, whenever the power source is interrupted or changed, and at completion. A failed closing check means the work since the last good reading cannot be shown to meet the procedure, so it is repeated with the lamp restored or replaced, reprocessing any parts whose interpretation window has passed. [ASME BPVC Section V, Article 6 (2023); procedure logic]
14. D — Article 6 requires visible and UV-A light meters to be calibrated at least once a year and whenever repaired, and a meter that has not been used for a year or more is calibrated before use. Recalibration, not replacement, returns it to service. [ASME BPVC Section V, Article 6 (2023)]
15. A — Rejectable indications must be recorded with at least their type, location and extent. Nonrejectable indications are recorded as the referencing Code Section specifies; a photograph is one way to make the record but is not the minimum content. [ASME BPVC Section V, Article 6 (2023)]
16. D — $\text{Length} \div \text{width} = (3/32) \div (1/32) = 3$, and an indication is linear only when its length is greater than three times its width, so this one is rounded. Its major dimension of 3/32 in. exceeds 1/16 in., so it is relevant, but a relevant rounded indication is rejected only above 3/16 in. or when four or more lie in line at 1/16 in. or less apart. [ASME BPVC Section VIII, Division 1, Mandatory Appendix 8 (2023)]
17. B — Appendix 8 rejects four or more relevant rounded indications in a line separated by 1/16 in. or less, edge to edge, even when each one alone would be acceptable. Each is relevant because 3/32 in. exceeds the 1/16 in. relevance threshold. [ASME BPVC Section VIII, Division 1, Mandatory Appendix 8 (2023)]
18. C — Appendix 8 treats any indication believed nonrelevant as an imperfection until re-examination by the same or another NDE method, or surface conditioning, shows that no unacceptable imperfection is present. A doubtful indication is settled by evidence, not by opinion. [ASME BPVC Section VIII, Division 1, Mandatory Appendix 8 (2023)]
19. B — B31.3 does not accept cracks, and it requires a defective item to be repaired or replaced and the new work reexamined by the same methods, to the same extent and by the same acceptance criteria as the original work. Because the defect was found by random examination, progressive sampling of that welder's work also applies. [ASME B31.3 (2022)]
20. A — B31.3 progressive sampling first requires two additional samples of the same kind by the same welder, given the same examination. If both are acceptable, the items they represent are accepted; if either is defective, two further samples are examined for each defective item, and further defects lead to full examination, or repair or replacement, of all items represented. [ASME B31.3 (2022)]

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