

# CBIP Examination Paper - Radiography Inspection

## Level 2 General

- 1 The absorption of X-rays when passing through a particular material depends on:
- A. The atomic number, density, and thickness of the material
  - B. The stress/strain relationship of the material
  - C. The temperature of the material
  - D. The type of film selected
- 2 An excellent radiograph is obtained with the film located at a distance of 40cm from the source. If the film is now placed 60cm from the source, and all exposure conditions except time are held constant, the new exposure time will be:
- A. Unchanged
  - B. About one and a half times as long as the original exposure
  - C. Shorter by approximately 50 percent
  - D. About 2 and a quarter times as long as the original exposure time
- 3 Cobalt-60 used in nondestructive testing emits:
- A. Alpha particles
  - B. Neutrons
  - C. Gamma rays
  - D. X-rays
- 4 The adjustment of tube current in conventional X-ray units is made by:
- A. Adjusting the filament heating current
  - B. Adjusting the target-to-cathode distance
  - C. Inserting resistance in the anode lead
  - D. Opening the shutter on the X-ray tube port
- 5 Isotopes are:
- A. A single element having a variety of orbiting protons
  - B. The name of Springfield's Soccer team
  - C. All Non radioactive elements
  - D. Varieties of the same element, having different numbers of neutrons

- 6 When a faster speed film is substituted for a slower one to reduce the exposure time, which of the following would most likely result?
- A. The film must receive special processing
  - B. The definition will improve
  - C. The radiographic sensitivity will be reduced
  - D. The radiographic sensitivity will be increased
- 7 Lead foil in direct contact with x-ray film:
- A. Intensifies the scatter radiation more than the primary radiation
  - B. Decreases the contrast of the radiographic image
  - C. Intensifies the primary radiation more than the scatter radiation
  - D. Should not be used with gamma radiation
- 8 When viewing a radiograph of a weld, small round dark indications within the weld would generally be caused by:
- A. Lack of penetration
  - B. Cracks
  - C. Inclusions
  - D. Porosity
- 9 Movement, geometry, and screen contact are three factors that affect radiographic:
- A. Contrast
  - B. Unsharpness
  - C. Reticulation
  - D. Density
- 10 As the development time is increased:
- A. The characteristic curve grows steeper and moves to the left
  - B. The characteristic curve grows steeper and moves to the right
  - C. The characteristic curve remains the same in shape but moves to the left
  - D. There is little effect on the characteristic curve
- 11 The developer solution is:
- A. Acid
  - B. Alkaline
  - C. Saline
  - D. Colloidal

- 12 Radiographic sensitivity, in the context of the minimum detectable flaw size, depends on:
- A. Graininess of the film
  - B. The unsharpness of the flaw image in the film
  - C. The contrast of the flaw image on the film
  - D. All three of the above
- 13 Iridium 192 has an approximate energy equivalent to
- A. 1.2 to 1.33 MeV
  - B. 600 KeV
  - C. 33 MeV
  - D. 100 KeV
- 14 The log<sub>10</sub> of 4 is
- A. 20
  - B. 0.6
  - C. 17
  - D. 0.1
- 15 A 3 mm source is positioned 500 mm away from the front of a 30 mm thick welded plate. If the film is placed on the back of the plate what would be the Geometric Unsharpness?  $U_g = F[t/d]$
- A. 3 mm
  - B. 0.32 mm
  - C. .001 mm
  - D. 0.18 mm
- 16 A photographic image recorded by the passage of X or gamma rays through a specimen onto a film is called a:
- A. Fluoroscopic image
  - B. Radiograph
  - C. Isotopic reproduction
  - D. None of the above

**17** A worker is found to have been in a radiation area, with a level of 5 mSv/hr, for a period of 6 minutes. The worker would have received a dose of:

- A. 1.2 mSv
- B. 44 mSv
- C. 0.5 mSv
- D. 1.77 mSv

**18** The depth of a discontinuity may be estimated by making two exposures from two different positions of the X-ray tube. The depth is computed from the shift in the shadow of the discontinuity with respect to the images of fixed markers on the front and back of the specimen. The method is referred to as:

- A. Stereoradiography
- B. Zero-radiography
- C. Fluoroscopy
- D. The double exposure or parallax method of depth location

**19** Three (3) factors directly affecting the Subject Contrast will be:

- A. Radiation Intensity, SFD and source strength
- B. Thickness changes, KV (or source energy) and scattered radiation
- C. Film type, source size and density
- D. SFD, source size and part thickness

**20** The intensity of gamma radiation, after going through 3 half value layers, would be reduced to approximately:

- A. 2.2 mSv/hr
- B. 25%
- C. 1%
- D. 12.5%