# Chapter 21

1. Steeper (more vertical) anode bevel angles cause:

a. larger projected focal spots

b. more severe anode heel effect

c. more penumbra

d. less motion

e. more intensity in the x-ray beam

2. The anode bevel angle is used to reduce the projected focal spot size relative to the actual

focal spot size, thereby improving spatial resolution (sharpness) without increasing heat

load on the anode disc. This is called the:

a. anode heel effect

b. fractional focal spot tube

c. air-gap technique

d. line-focus principle

e. Moire effect

3. Damage to the surface of the anode focal track can directly affect the:

a. intensity of exposure at the receptor plate

b. subject contrast in the remnant beam

c. spatial resolution (sharpness)

d. magnification

e. shape distortion

4. A radiograph is actually slightly sharper at the “cathode” end than at the “anode” end. This is

because of the:

a. line-focus principle

b. anode heel effect

c. use of fractional focal spots

d. focal spot blooming

5. The severity of the anode heel effect when using fractional focal spots in angiographic

equipment imposes a limit on the:

a. length of exposure times that can be practically used

b. length of receptor plates that can be practically used

c. margin of error in positioning

d. amount of angle that can be placed on the CR

6. Smaller focal spot sizes cause:

a. less magnification

b. less exposure

c. less “off-focus” radiation

d. more anode heel effect

e. less blur

7. Fractional focal spot sizes must be used for:

a. air-gap technique

b. stereoradiography

c. magnification technique

d. inverse square law

e. Ceiszynski’s law

8. Larger focal spot sizes result in:

a. smaller penumbral “shadows”

b. smaller umbral “shadows”

c. smaller gross image sizes

d. larger gross image sizes

e. greater exposure intensity

9.The focal spot is directly responsible for the production of geometrical penumbra in the image

because:

a. x-rays can be emitted at various angles from different points within it

b. x-rays must pass through differing thicknesses of anode material upon being emitted

c. x-rays emitted at one end have longer distances to travel than those at the other end

d. a point-source of radiation is required to produce penumbra

10. Exactly doubling the focal spot size will cause the spread of penumbra to:

a. double

b. quadruple

c. reduce to ½

d. reduce to 1/4

e. increase, but the relationship is not directly proportional

11. If the focal spot is very much larger than the anatomy or pathology of interest, the image of

the anatomy can be caused to:

a. magnify in gross size

b. disappear

c. solarize

d. “burn out” from excessive exposure

12. With all other factors unchanged, if focal spot size is increased, the overall exposure level

at the image receptor plate will:

a. increase as a direct result

b. decrease as a direct result

c. not change at all

d. may be affected indirectly, but is not directly controlled by it

13. With all other factors unchanged, if the focal spot size is decreased, magnification in the

image will:

a. increase as a direct result

b. decrease as a direct result

c. not change at all

d. may be affected indirectly, but is not directly controlled by it

14. The size of the *effective* or *projected* focal spot is its size as measured:

a. perpendicular to the electron stream

b. along the surface of the anode bevel

c. perpendicular to the long axis of the x-ray tube

d. from the viewpoint of the image receptor

15. The typical range of anode bevel angles for general purpose diagnostic x-ray tubes is:

a. 15-17 degrees

b. 10-12 degrees

c. 7-10 degrees

d. 5-7 degrees

16. Due to their different points of origin within the focal spot, the gradient partial absorption of

x-rays as a function of the total absorption which an anatomical structure is capable of

defines:

a. absorption penumbra

b. geometrical penumbra

c. the heel effect

d. detail contrast

17. For an AP foot positioned with the thickest part of the foot to the radiographer’s *left*, which of the following could contribute to mottle in the CR or DR image?

a. the saturation effect

b. the anode heel effect

c. the line-focus effect

d. the compton effect

18. For digital radiography, the final degree of spatial resolution (sharpness) in the displayed

image is limited not only by the focal spot size, but also by:

1. Pixel or del size
2. Noise reduction algorithms
3. Rescaling
4. Anode-heel effect