Chapter 14:

1. Which of the following can be described is low spatial resolution (sharpness):

a. high umbra

b. low brightness

c. good blur

d. short gray scale

e. high penumbra

2. Which of the following should always be *maximized:*

a. brightness

b. contrast

c. magnification

d. elongation

e. spatial resolution (sharpness)

3. Which of the following is equivalent to low penumbra:

a. low spatial resolution (sharpness)

b. high sharpness

c. high blur

d. low distortion

e. low magnification

4. Foreshortening is a form of:

a. magnification

b. noise

c. umbra

d. shape distortion

e. artifact

5. The projected image of a bone on a radiograph is twice as wide, but three times as long as the

real bone. The image is:

a. magnified

b. distorted

c. unsharp

d. both a & b

e. both b & c

6. The ability to distinguish two adjacent details as being separate and distinct from each other

defines image:

a. contrast

b. magnification

c. resolution

d. visibility

7. The overall resolution of an image depends upon:

a. sharpness

b. contrast

c. visibility

d. geometrical factors

e. all of the above

8. As one visually scans across an image, the abruptness with which the edges of a particular

image “stop” would define the image’s:

a. sharpness

b. unsharpness

c. overall resolution

d. distortion

e. contrast

9. The complete or “true” image shadow of a radiographic image is called its:

a. penumbra

b. edge gradient

c. umbra

d. parallax

e. density trace

10. Penumbra occurs in all radiographic images because:

a. some degree of motion cannot be avoided

b. x-rays emanate from an area source

c. x-rays are emitted from a point source

d. some degree of scatter radiation is always present

11. As the penumbra of an image spreads, the:

a. umbra grows also

b. umbra shrinks

c. umbra remains unaffected

d. image becomes distorted

e. image becomes magnified

12. The unsharpness in an image is produced by all of the following *except:*

a. mAs

b. SOD

c. OID

d. focal spot size

13. The amount of penumbra that will be produced in a radiographic projection can be predicted

using penumbra diagrams, and is based mathematically upon:

a. solid geometry

b. similar triangle geometry

c. signal-to-noise ratio

d. modulation transfer function

14. Which of the following formulas would be correct for calculating the relative sharpness of a

projected image?

a. SID/SID-OID

b. SID/OID

c. SOD/OID

d. SID-OID/SOD

15. The formula *FS X OID/SOD* is used to calculate the in a radiographic image:

a. unsharpness

b. sharpness

c. magnification

d. distortion

e. noise

16. With an SID of 100 cm, and an OID of 25 cm, what is the factor of magnification?

a. .25 X

b. 3 X

c. 1.33 X

d. 4 X

e. 2 X

17. When a 1 mm focal spot is used with an SID of 100 cm and an OID of 50 cm, the amount of

penumbra present in the image will be:

a. 1 mm

b. 2 mm

c. 0.5 cm

d. 0.2 mm

e. 0.5 mm

18. An object being radiographed measures 4 cm in width. The SID used was 100 cm and the

object was located 60 cm above the image receptor plate. How big is the projected

image?

a. 4 cm

b. 6.7 cm

c. 8 cm

d. 10 cm

e. 12 cm

19. What is the amount of unsharpness for a projection taken with an 0.3 mm focal spot, 76 cm

SOD and 4 cm OID?

a. 0.63 mm

b. 0.016 mm

c. 1.6 mm

d. 0.8 mm

e. 5.7 mm

20. What is the amount of unsharpness for a projection taken with an 0.5 mm focal spot, 150 cm

SOD and 15 cm OID?

a. 5 mm

b. 10 mm

c. 20 mm

d. 0.5 mm

e. 0.05 mm

21. What is the relative sharpness for an SOD of 70 cm and an OID of 10 cm?

a. 7

b. 3.3

c. 0.14

d. 1.17

e. 0.85

22. An original exposure used an SOD of 80 cm and an OID of 4 cm. If the OID is increased to 6

cm, to what fraction of the original sharpness will the sharpness be reduced?

a. 0.13

b. 0.25 (1/4)

c. 0.67 (2/3)

d. 0.75 (3/4)

23. An object is projected using an SID of 180 cm and an SOD of 135 cm. If the projected image measures 20 cm in length, how big must the object have been?

a. 20 cm

b. 15 cm

c. 12 cm

d. 26 cm

24. For the image of an object to be shape distorted, its length and its width must be altered by:

a. off-centering

b. one being reduced, the other increased

c. the same degree

d. different degrees

25. The geometric qualities in an image include all of the following *except:*

a. sharpness

b. magnification

c. distortion

d. noise