Chapter 13
Computed Tomography

1. The pixel in a CT image represents the average linear attenuation coefficient of the material in the corresponding voxel. (True or False)

2. Which of the seven generations of CT scanners are currently used today?

3. What is a slip ring and why is it important in modern CT scanners?

4. In a single slice CT scanner, what determines the slice thickness?

5. In a multi-slice CT scanner, what determines slice thickness?

6. For the same technique a 10mm slice thickness will have (more or less) noise than a 5mm slice?

7. Patient dose (higher, lower or essentially the same) for the 10mm slice compared to the 5mm slice.

8. Pitch in a multi-slice helical scanner refers to collimator pitch. (True or False)

9. A pitch of less than one implies overlapping scans. (True or False)

10. Distinguish between radial and circumferential resolution and what scan parameters determine each.

11. What is a ray and how are rays and projections related?

12. Enumerate the steps in the generation of a CT image. Which spatial filter reduces the appearance of noise in a CT image and why? In what circumstances would a noise reducing filter be used?

13. What physical characteristic of tissue primarily determines its CT number?

14. Helical CT scans compared to axial CT scans covering the same tissue volume are:

   Answer True or False for each of the following:

   A. Higher in dose? True or False
   B. Create more scatter? True or False
   C. Require longer scan time? True or False
   D. Have slightly greater slice thickness for the same nominal slice thickness? True of False
15. The linear attenuation co-efficient of a tissue with negative CT number is higher than water. (True or False)

16. What does CTDI stand for?

17. To maintain the same signal to noise ratio (SNR) CT dose must be increased if pixel size decreases. (True or False)

18. To maintain the same signal to noise ratio (SNR) CT dose must be increased if slice thickness is decreased. (True or False)

19. Increasing MAS increases dose and contrast resolution. (True or False)

20. Increasing MAS increases signal to noise ratio. (True or False)

21. Increasing patient size decreases signal to noise ratio and to compensate higher kVp’s and MAS are needed. (True or False)

22. kVp and MAS can be reduced significantly for pediatric patients without significantly decreasing image quality. (True or False)

23. The typical radiation dose for CT scans of the adult head is __________ and __________ for the body.