mAs

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Which of the following is equivalent to 0.5 seconds?
a. 50 milliseconds
b. 2500 milliseconds
c. 500 milliseconds
d. 0.005 milliseconds

____ 2. What is the mAs when 400 mA is used with a 50-millisecond exposure time?
a. 20
b. 200
c. 2
d. 2000

____ 3. An x-ray exposure is made using the following factors: 300 mA, 0.02 sec, 60 kVp, 60-inch SID, and the large focal spot. In this case, the value of the mAs is:
a. 0.06.
b. 0.6.
c. 6.
d. 60.

____ 4. A satisfactory radiograph is made using 100 mA, 0.2 sec, 80 kVp, and 40-inch SID. How much exposure time is required to produce a similar radiograph when using 400 mA?
a. 0.05 sec
b. 0.08 sec
c. 0.1 sec
d. 0.4 sec

____ 5. What are the four primary exposure factors?
a. kVp, mAs, filtration, and voltage ripple
b. mA, time, distance, and filtration
c. kVp, mAs, time, and SID
d. mA, time, kVp controls, and focal spot size

____ 6. An increase in mAs causes _____ in beam quality and _____ in beam quantity.
a. an increase, a decrease
b. an increase, no change
c. an increase, an increase
d. no change, an increase

____ 7. There is a direct relationship between the quantity of x-rays and the _____.
a. milliamperage
b. kilovolt peak
c. filter thickness
d. voltage ripple

____ 8. If mAs is increased from 20 mAs to 40 mAs, the patient dose will _____.
   a. not be affected
   b. increase slightly
   c. be halved
   d. be doubled

____ 9. Beam penetrability is increased if _____ is/are increased.
   a. mAs
   b. SID
   c. kVp
   d. all of the above

____ 10. An x-ray exposure is made using the following factors: 200 mA, 0.04 second, 80 kVp, and 40 inches SID. In this case, which represents the value of the mAs?
   a. 0.08
   b. 0.8
   c. 8
   d. 16,000

____ 11. A doubling of the mA with no change in exposure time will result in which of the following?

   1. Increased anode heat
   2. Increased radiographic exposure
   3. Increased number of photons in the x-ray beam

   a. 1 only
   b. 2 only
   c. 1 and 2
   d. 1, 2, and 3

____ 12. A device used to control the size of the radiation field is a:
   a. collimator.
   b. tube housing.
   c. detent.
   d. filter.

____ 13. What type of relationship do mAs have with the quantity of x-rays produced?
   a. direct proportional
   b. direct but not proportional
   c. inverse proportional
   d. inverse but not proportional

____ 14. Given 40 mAs, doubling the mA produces the same result as:
   a. doubling the time of exposure
   b. doubling the mAs
   c. A and B
   d. none of the above

____ 15. How much mAs is produced when the mA is 200 and the exposure time is 0.5 s?
a. 25 mAs
b. 50 mAs
c. 100 mAs
d. 200 mAs

____ 16. How much mAs is produced when the mA is 800 and the exposure time is 30 ms?
a. 24 mAs
b. 240 mAs
c. 2,4000 mAs
d. 24,000 mAs

____ 17. If the mA is 600 and exposure time is 10 ms, how can the mAs be doubled?
a. increase the mA to 1200
b. increase the time to 20 ms
c. increase the mAs to 12 mAs
d. all of the above

____ 18. Which of the following exposure factors produces 20 mAs?
a. 200 mA @ 1 s
b. 100 mA @ 2 s
c. 100 mA @ 0.5 s
d. 200 mA @ 100 ms

____ 19. What mA should be selected to produce 32 mAs using a 0.04 exposure time?
a. 128 mA
b. 200 mA
c. 400 mA
d. 800 mA

____ 20. In maintaining the same mAs, there is a(n) _____ relationship between mA and exposure time.
a. direct
b. inverse
c. added
d. none of the above

____ 21. 200 mA @ 80 ms (0.08 s) produces 16 mAs. Which of the following exposure factors maintains 16 mAs while using a shorter exposure time?
a. 100 mA @ 0.16 s
b. 200 mA @ 0.16 s
c. 400 mA @ 0.04 s
d. 400 mA @ 0.08 s

____ 22. Which of the following is equivalent to 2 seconds?
a. 200 milliseconds
b. 2000 milliseconds
c. 0.2 milliseconds
d. 0.002 milliseconds

____ 23. An x-ray exposure is made using the following factors: 100 mA, 0.06 sec, 60 kVp, 60-inch SID, and the small focal spot. In this case, the value of the mAs is:
a. 0.06.
b. 0.6.
c. 6.
d. 60.

____ 24. An x-ray exposure is made using the following factors: 200 mA, 0.03 sec, 80 kVp, 40-inch SID, and the large focal spot. In this case, the value of the mAs is:
a. 0.06.
b. 0.6.
c. 6.
d. 60.

____ 25. An x-ray exposure is made using the following factors: 200 mA, 200 msec, 60 kVp, 60-inch SID, and the small focal spot. In this case, the value of the mAs is:
a. 2
b. 20
c. 40
d. 400

mAs
Answer Section

MULTIPLE CHOICE

1. ANS: C PTS: 1 REF: Page 30
2. ANS: A PTS: 1 REF: Page 33
3. ANS: C PTS: 1 REF: Page 34
4. ANS: A PTS: 1 REF: Page 35
5. ANS: C
   The four primary exposure factors are kVp, mAs, time, and SID.

   PTS: 1 DIF: Moderate REF: page 237
   OBJ: List the four prime exposure factors.
6. ANS: D
   An increase in mAs causes no change in beam quality and an increase in beam quantity.

   PTS: 1 DIF: Moderate REF: page 238
   OBJ: Discuss mAs in relation to x-ray beam quantity and quality.
7. ANS: A
   There is a direct relationship between the quantity of x-rays and the milliamperage.

   PTS: 1 DIF: Moderate REF: page 238
   OBJ: Discuss mAs in relation to x-ray beam quantity.
8. ANS: D
   If mAs is increased from 20 mAs to 40 mAs the patient dose will be doubled.

   PTS: 1 DIF: Moderate REF: page 239
   OBJ: Discuss mAs in relation to patient dose.
9. ANS: C
   Beam penetrability is increased if kVp is increased.

   PTS: 1 DIF: Moderate REF: page 237
   OBJ: Discuss kVp in relation to x-ray beam penetrability.
10. ANS: C
    Rationale: mAs is the product of mA and time (200 mA × 0.04 sec = 8 mAs).

    PTS: 1 REF: p. 20
11. ANS: D
    Rationale: Because mA determines the rate at which x-rays are produced, the anode heat, radiographic exposure, and number of photons in the x-ray beam all are proportional to the mA setting and are therefore increased when the mA is doubled.

    PTS: 1 REF: p. 20
12. ANS: A
    Rationale: The term for the device attached to the tube housing to permit control of radiation field size is “collimator.”

PTS: 1 REF: p. 8

13. ANS: A
There is a direct proportional relationship between mAs and quantity of radiation; if the mAs are doubled, the amount of radiation is doubled.

PTS: 1 OBJ: 3

14. ANS: C
Doubling the mA doubles the mAs, as does doubling the exposure time.

PTS: 1 OBJ: 3

15. ANS: C
In that mAs = mA × exposure time (in seconds), 200 × 0.5 = 100 mAs.

PTS: 1 OBJ: 4

16. ANS: A
In that mAs = mA × exposure time (in seconds), 800 × 0.03 = 24 mAs.

PTS: 1 OBJ: 4

17. ANS: D
Doubling the mA, time, or mAs results in the same outcome.

PTS: 1 OBJ: 4

18. ANS: D
200 mA × 100 ms (0.10 s) = 20 mAs.

PTS: 1 OBJ: 4

19. ANS: D
If mAs = mA × seconds, mA = mAs/seconds, or 32/.04, which equals 800 mA.

PTS: 1 OBJ: 4

20. ANS: B
To maintain the same mAs, if the mA is increased, the exposure time must decrease, resulting in an inverse relationship.

PTS: 1 OBJ: 4

21. ANS: C
By doubling the mA and halving the seconds, 400 mA @ 0.04 s equals 16 mAs while shortening the exposure time.

PTS: 1 OBJ: 3

22. ANS: B PTS: 1 REF: Page 30
23. ANS: C PTS: 1 REF: Page 34
24. ANS: C PTS: 1 REF: Page 34
25. ANS: C PTS: 1 REF: Page 34