# Chapter 35

1. A digital-to analog converter (DAC) is used between which two stages of the imaging chain:

a. Setting technique and exposure

b. Exposure (acquisition) and processing

c. Processing and storage

d. Storage and display

2. The centralized storage and distribution services of a PAC system are classified as a(n):

a. service class user

b. service class provider

c. WAN

d. SAN

3. The heart of the PAC system, which directs all data, is a:

a. server

b. workstation

c. node

d. jukebox

e. service class user

4. A jukebox contains 100 or more:

a. dynamic flat panels

b. flash drives

c. tapes

d. discs

5. The standard high-level language used to interface between all different brands of medical

imaging equipment is known as:

a. RAID

b. Visual basic

c. H7

d. DICOM

6. The *Digital Imaging and Communication in Medicine* standard specifies the \_\_\_\_\_\_\_\_\_ of

various devices:

1. architecture
2. terminology
3. transmission behavior
4. application software

7. All of the following are DICOM commands *except:*

a. query

b. retrieve

c. get worklist

d. window level

e. DICOM print

8. The extensive, detailed information stored “behind” every image is its:

a. metadata

b. data base

c. protocol

e. worklist

9. Key items of interest to caregivers are made easily accessible at the touch of a button while

the image is displayed, as a DICOM:

1. query
2. get-list
3. menu
4. header

10. Each line of information in the metadata begins with a DICOM \_\_\_\_\_\_\_ number:

a. tag ID

b. accession

c. patient ID

d. procedure

11. For internet access, confidentiality must be protected with \_\_\_\_\_\_\_\_\_\_ software:

a. applications

b. systems

c. encryption

d. compression

e. rescaling

12. *Lossless* compression ratios used for medical diagnosis are defined as ratios:

a. less than 8:1

b. more than 8:1

c. less than 10:1

d. more than 10:1

13. For CR, DR, CT, MRI, NM and US units, images are usually erased \_\_\_\_\_\_ after

acquisition:

a. 8 hours

b. 24 hours

c. 16 hours

d. 3 days

e. 5 days

14. Images are usually erased from storage after 5 days for:

a. radiologists’ workstations

b. CR and DR units

c. MRI and CT units

d. the PAC system

e. ER workstations

15. Within a PACS server, storage using jukeboxes in a separate location would be classified as

\_\_\_\_\_\_\_\_\_ storage:

a. on-line

b. archive

c. lossless

d. lossy

e. temporary

16. The ability of a PAC system to automatically search the HIS and RIS for previous images

and records for patients scheduled the following day is known as:

a. retrieve study

b. archiving

c. get-worklist

d. prefetching

17. To preserve image quality and manipulation features when images are sent to clinical sites,

DICOM \_\_\_\_\_\_\_ should be included on CDs or DVDs:

1. directories
2. viewers
3. headers
4. service-class providers

18. A sub-network connecting several storage devices at remote geographic locations or other

clinical sites is called a(n):

a. SAN

b. WAN

c. URL

d. LAN

19. When one component fails in a storage area network, in order to prevent breaking

connections between other components, all devices are connected:

1. in parallel
2. in series
3. electromagnetically
4. in a bridge circuit

20. The software standard for exchanging electronic *text* information between departments and

institutions in a compatible format is:

a. SAN

b. RAID

c. HL7

d. DICOM

e. ALARA

21. A true DICOM *header* is displayed as a bar:

a. at the top of the metadata files

b. at the top of the displayed image

c. at the bottom of the patient’s RIS file

d. at the top of the patient’s RIS file

22. Which of the following is defined as the effective use of medical data and information to

improve the management and integration of images, efficiency, accuracy and real-time

interactive functionality of imaging services:

1. Hospital information systems
2. Administrative information systems
3. DICOM modality worklists
4. Medical imaging informatics

23. *Standardization* of the way health information is retrieved, exchanged, integrated and shared

is achieved by:

1. Transmission control protocol (TCP)
2. The Health Level Seven standard
3. The DICOM standard
4. HIPAA (the Health Insurance Portability and Accountability Act)

24. The electronic version of a patient’s chart, used by a particular healthcare provider, is the:

a. Electronic health record

b. Electronic medical record

c. RIS record

d. DICOM modality worklist

25. All of the following are essential components of *security* for medical records and information

*except:*

1. System integrity
2. Authentication
3. Privacy
4. Internet protocol (IP)

26. The Health Insurance Portability and Accountability Act (HIPAA) holds all healthcare

providers accountable to maintain each patient’s \_\_\_\_\_\_\_.

1. Safety
2. Health
3. Privacy
4. Dignity

27. Which of the following is best defined as a set of rules that facilitate the exchange of data

between the nodes of any computer network:

1. A protocol
2. An HIS/RIS broker
3. A router algorithm
4. Health Level Seven

28. An institutions’ unique way of identifying a specific procedure or exam on a particular

patient is the procedure’s:

1. HIS number
2. Accession number
3. ID number
4. PAC/RIS number

29. The “umbrella” computer system that integrates all information flow within a hospital or

clinic is the:

1. HIS
2. RIS
3. PACS
4. EMR

30. Which of the following connect wide area networks (WANs) to the internet:

a. a broker

b. an intranet

c. a workstation

d. a router

31. The link that transfers patient information between image acquisition stations and the RIS or

HIS is a:

1. DICOM modality worklist
2. Router
3. Broker
4. LAN

32. The data transfer rate through connections between various nodes of a computer network,

usually measure in bits per second (bps), is controlled by the system’s:

1. Internet protocol (IP)
2. Transmission control protocol (TCP)
3. Bandwidth
4. Processor speed

33. Which of the following features at the radiologist’s workstation can be part of the PAC

system:

1. Prefetch programs
2. Computer-aided-diagnosis (CAD) programs
3. Intelligent image hanging protocols
4. All of the above
5. None of the above

34. The DICOM standard was developed to ensure:

a. radiographic image quality and consistency

b. compatibility between medical systems that store information

c. compatibility between computerized imaging systems and analog systems

d. consistency in the computerized diagnostic process (CAD) for mammography

35. Modern PAC systems can store over a million medical images using 100 or more discs

arranged in stacks called:

1. RAIDS
2. SANS
3. Cylinders
4. Jukeboxes
5. Pyramids

36. The PACS is the portion of a digital radiologic imaging system that is involved with:

a. production of soft copy images

b. manipulation of soft copy images

c. storage and transfer of soft copy images

d. acquisition of soft copy images

e. production of hard copy images

37. A device which converts electronic data signals into either sound pitches or light colors

(wavelengths) in order to allow telephone lines or optic cables to transfer information

between computer systems is a(n):

* 1. A protocol
  2. An HIS/RIS broker
  3. A router algorithm
  4. A modem

1. Which of the following uses dotted-quad format to identify each computer node within a network:
   1. IP
   2. TCP
   3. Routers
   4. Firewalls
2. Which of the following has the lowest tolerance for image compression, which must be kept well below a 20:1 ratio:
   1. Chest radiographs
   2. Spine radiographs
   3. Extremity radiographs
   4. MRI
3. Multiplying the rows and columns of the image matrix by the bit depth of the pixels gives us an image’s”
   1. resolution
   2. compression ratio
   3. dynamic range
   4. computer file size
4. An ethernet-based LAN that makes images and data available to multiple institutions within a group would qualify as:
   1. cloud storage
   2. a RAID system
   3. direct-access storage (DAS)
   4. network attached storage (NAS)
5. Which of the following was developed to address the incompatibility of image storage and access systems from different manufacturers that forced hospitals and clinics to “migrate” tens of thousands of images from one system to another every time a change was made:
   1. Vendor-neutral archives (VNAs)
   2. Cloud storage
   3. Electronic medical records (EMRs)
   4. Direct-access storage (DAS)
6. Which of the following is an expansion of the conventional PACS systems that makes medical images of all kinds related to a patient available to multiple institutions:
   1. RIS
   2. MIMPS
   3. DICOM
   4. VNAs
7. The *baud rate* is the unit for the speed of transmission between computer systems in:
   1. Hertz (cycles per second)
   2. Kilobytes per hour
   3. Bits per second
   4. Kilometers per second
8. Within a PACS, an image acquisition station is considered a:
   1. service class user
   2. service class provider
   3. WAN
   4. SAN
9. For cost-effective long-term storage, which of the following is necessary:
   1. Image encryption
   2. Authentication
   3. High bandwidth
   4. Image compression
10. Compression ratios above 10:1 are defined as:
    1. Lossless
    2. Lossy
    3. High-bandwidth
    4. High-frequency
11. Quickly accessible image storage in on-site devices is termed \_\_\_\_\_\_\_\_\_ storage:
    1. Inactive
    2. Archive
    3. Long-term
    4. On-line
12. Which of the following approaches provides the highest viewing quality and most powerful options for image manipulation:
    1. Integrate PACS images into the patient’s EMR
    2. Install PACS software on existing devices
    3. Install a PACS workstation
    4. All the above are about equal
13. Which of the following distributes copies of the same data files across several computer hard drives which are independent of each other:
    1. RAID
    2. SAN
    3. PACS
    4. HL7
14. Which of the following describes a complete, lifelong medical history designed to be shared between healthcare providers:
    1. EMR
    2. EHR
    3. HL7
    4. HIPAA
15. Which of the following types of security guarantees incoming information has not been tampered with:
    1. Privacy
    2. Authentication
    3. System integrity
    4. Firewalls
16. Which of the following is comprised of *Clinical Information Systems* plus *Administrative information systems:*
    1. RIS
    2. HIS
    3. HIPAA
    4. SAN
17. In the U.S., the Health Insurance Portability and Accountability Act (HIPAA) holds all healthcare providers accountable to maintain each patient’s \_\_\_\_\_\_\_.
    1. Safety
    2. Health
    3. Privacy
    4. Dignity
18. Which of the following is designed to ensure that computerized files of images and patient information cannot be permanently lost:

a. PACS

b. HIS

c. RIS

d. RAID