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POST TEST

For
Continuing Education Home Study Course:

PART 3: Digital Radiography an Introduction

(Covers Chapters 8 - Appendix A)

4.5 Category A Continuing Education Credits

This course has been reviewed and approved by the
American Society of Radiologic Technologists (ASRT) and is accepted by ARRT.
It has been assigned 4.5 Category A Continuing Education Credit Hours.

COURSE OBJECTIVE:

The objective of this course is provide a comprehensive guide to all the major issues relating to digital imaging at a practical level.

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TEST PART 3: DIGITAL RADIOGRAPHY An Introduction (Chapter 8 to Appendix A – 55 Questions)

1. A picture archiving and communications system (PACS) permits viewing of images in distant locations.
 - a. True
 - b. False
2. In the _____ model of PACS (picture archiving and communications system), a manufacturer develops the PACS, sells it to a hospital and accepts implementation responsibility
 - a. turnkey
 - b. two-team partnership
 - c. pass-down
 - d. pass-back
3. What is a MAJOR component of a picture archiving and communications system (PACS)?
 - a. archive server
 - b. Web server
 - c. image-display subsystems
 - d. all of the above
4. Image acquisition modalities MUST be _____ in nature to be part of a picture archiving and communications system (PACS).
 - a. analog
 - b. archival
 - c. magnetic
 - d. digital
5. Which of the following is an example of a digital image acquisition modality which uses frame grabbing?
 - a. computed tomography
 - b. magnetic resonance imaging
 - c. digital fluoroscopy
 - d. ultrasound
6. The _____ determines whether it is categorized as a local area network (LAN) or wide area network (WAN).
 - a. length of computer network cables
 - b. types of computers connected to a network
 - c. distance covered by a network
 - d. maximum amount of data that can be transmitted at one time
7. In a _____ configuration of a local area network (LAN), all computers connect to a central computer, also known as a hub.
 - a. star
 - b. ring
 - c. octagon
 - d. loop
8. A network used inside a SINGLE organization, like a radiology department, is _____.
 - a. a wide area network (WAN)
 - b. a departmental area network (DAN)
 - c. an intranet
 - d. the internet
9. What is the bandwidth of a computer network which uses Fast Ethernet?
 - a. 100 kbits/sec (kilobits per second)
 - b. 1.54 Mbits/sec (Megabits per second)
 - c. 100 Mbits/sec (Megabits per second)
 - d. 1 Gbit/sec (Gigabit per second)
10. Which of the following types of image storage CANNOT be removed?

- a. online storage
 - b. nearline storage
 - c. offline storage
 - d. all of the above
11. Image compression speeds up transmission of information and _____.
- a. decreases artifacts
 - b. increases contrast
 - c. reduces storage requirements
 - d. increases storage requirements
12. Which is the current compression method for DICOM (Digital Imaging and Communications in Medicine)?
- a. GIF (Graphics Interchange Format)
 - b. PNG (Portable Network Graphic)
 - c. JPEG (Joint Photographic Experts Group)
 - d. BMP (Bitmap)
13. The compression ratio when using LOSSLESS compression methods is _____.
- a. 2:1 to 3:1
 - b. 4:1 to 6:1
 - c. 8:1 to 10:1
 - d. 10:1 to 50:1
14. In a PACS environment, radiologists utilize _____ workstations for PRIMARY diagnosis.
- a. bright-screen
 - b. high-resolution display
 - c. medium-resolution display
 - d. extra large monitor
15. Letting users access images _____ is the MAJOR purpose of the Web Server in PACS.
- a. quickly
 - b. remotely
 - c. in real-time
 - d. in three dimensions
16. Patient, image and information movement around an imaging department and healthcare enterprise is known as _____.
- a. networking
 - b. workflow
 - c. informatics
 - d. discreet data
17. In digital radiology, an information system processes data.
- a. True
 - b. False
18. A hospital information system (HIS) is an information system that is computer-based.
- a. True
 - b. False
19. A radiology information system (RIS) performs which of the following functions?
- a. film archiving
 - b. patient tracking
 - c. patient registration
 - d. all of the above
20. The transfer of TEXTUAL information between a radiology information system (RIS), hospital information system (HIS) and other information systems relies on which data exchange standard?
- a. HL-7 (Health Level-7)

- b. DICOM (Digital Imaging and Communications in Medicine)
 - c. HTTP (Hypertext Transfer Protocol)
 - d. UHDDS (Uniform Hospital Discharge Data Set)
21. In its simplest configuration, how many devices are involved in DICOM communication?
- a. two
 - b. four
 - c. six
 - d. ten
22. Which of the following is one of two organizations behind the standards-based initiative known as Integrating the Healthcare Enterprise (IHE)?
- a. Radiological Society of North America (RSNA)
 - b. United States Nuclear Regulatory Commission (NRC)
 - c. United States Food and Drug Administration (FDA)
 - d. American Board of Imaging Informatics (ABII)
23. Which of the following is NOT one of four remote access technologies which meet the challenges of effective distribution in enterprise-wide image distribution?
- a. thin client web-based
 - b. thin client just-in-time
 - c. hard-copy printing
 - d. compact disk, read-only memory (CD-ROM)
24. A picture archiving and communications system (PACS) is NOT subject to federal regulations and other regulations because it is NOT considered a medical device.
- a. True
 - b. False
25. Diagnosis, treatment and _____ in both humans and animals are ALL activities that medical devices are used for.
- a. reconstruction
 - b. prevention of disease
 - c. rehabilitation
 - d. all of the above
26. In the United States, in what year did the Health Insurance Portability and Accountability Act (HIPAA) become law?
- a. 1984
 - b. 1988
 - c. 1996
 - d. 2006
27. Computer central processing units, keyboards, monitors, printers and memory chips are all examples of _____.
- a. computer programming
 - b. computer software
 - c. computer hardware
 - d. stand-alone devices in PACS
28. The FUNDAMENTAL computer operation known as _____ is achieved by using a keyboard to enter data.
- a. communications
 - b. processing
 - c. output
 - d. input
29. Topology describes a network's _____.
- a. cost or price-per-component
 - b. computer hardware
 - c. top-end transmission rate and capacity

- d. layout or configuration
30. Medical imaging informatics is BEST described as _____.
- a. the application of geometry to medical imaging
 - b. the application of physics to medical imaging
 - c. the application of information technology to medical imaging
 - d. the application of medical software to medical imaging
31. Which of the following is NOT one of the three major sections of the framework for medical imaging informatics envisioned and described by Huang?
- a. customized software
 - b. knowledge base management
 - c. inferential targeting
 - d. imaging informatics database
32. In a PACS environment, which display workstation tool is a diagnostic aid to help with soft-copy interpretation?
- a. prefetch algorithm
 - b. hanging protocol
 - c. decision-support tools
 - d. image processing
33. Order entry systems, lab information systems, radiology information systems and monitoring systems are examples of _____.
- a. administrative information systems
 - b. digital imaging and communication in medicine
 - c. clinical information systems
 - d. healthcare integration
34. A requirement for systems integration is _____, which connects systems and allows data exchange.
- a. a collaboration network
 - b. an interface
 - c. a data directory
 - d. a matrix
35. Which type of security threat is an attack on operating systems through such means as viruses, worms, Trojan horses and denial of service attacks?
- a. data attack
 - b. software attack
 - c. hack attack
 - d. password theft
36. Which of the following is a security method to protect a computer system?
- a. antivirus software
 - b. passwords
 - c. physical security
 - d. all of the above
37. How many levels of PACS certification exist?
- a. one
 - b. two
 - c. three
 - d. four
38. WHEN should the quality control step of acceptance testing be performed?
- a. before the imaging device is used for patients
 - b. following a manufacturer-specified time period after use on patients
 - c. following FDA's specified time period after use on patients
 - d. following patient over exposure

39. Image quality can be described in terms of _____.
- contrast, resolution and noise
 - contrast, size and storage requirements
 - contrast, resolution and expertise required to produce it
 - contrast, modality, precision
40. What does a process map display?
- the steps involved in performing a digital radiography examination
 - the most effective route to the target area
 - the most effective modality to achieve optimal success
 - the most effective way to produce images after a digital radiography examination
41. In digital radiography, _____ contain(s) particular image data, including how the image was acquired and processed.
- an accompanying physical file
 - metadata
 - the resulting image
 - a microchip embedded in the image
42. When an exam request is printed, to reduce typographical errors, what can be added to the digital radiography acquisition station as a replacement for the keyboard?
- a camera
 - a bar-code scanner
 - a microphone with talk to text capabilities
 - an microchip reader
43. The DICOM (Digital Imaging and Communications in Medicine) modality worklist has completely eliminated misassociation of demographic and exam information and digital radiography images.
- True
 - False
44. Which of the following BEST describes the uniformity of digital radiography detectors?
- precisely uniform
 - inherently uniform
 - inherently nonuniform
 - none of the above
45. A _____ image results when a prior exposure on a digital radiography receptor is NOT completely erased.
- ghost
 - white-out
 - bifurcated
 - high contrast
46. In a digital radiography system, _____ controls how much signal is created when the receptor is exposed to a certain amount of radiation.
- a subtraction tool
 - gain adjustment
 - amplification
 - the operator
47. When should a visual assessment of digital radiography image quality be conducted?
- for every digital radiography image
 - only when a quality assurance program requires it
 - when ghost images are detected
 - every month
48. Which of the following is considered a possible error that could result when the image receptor renders the captured projection for viewing?

- a. incorrect histogram rescaling
 - b. incorrect grayscale rendition
 - c. incorrect edge restoration
 - d. all of the above
49. Which of the following is a technique for evaluating and improving the quality of imaging operations?
- a. risk analysis
 - b. reject analysis
 - c. bit depth analysis
 - d. beam evaluation
50. In digital radiography, which of the following BEST describes the relationship between exposure latitude and image receptor latitude?
- a. exposure latitude is a much larger value than image receptor latitude
 - b. exposure latitude is an equal value to image receptor latitude
 - c. exposure latitude is a much smaller value than image receptor latitude
 - d. exposure latitude and image receptor latitude always refer to the same value
51. Which of the following is a consequence of UNDEREXPOSURES exceeding the limit-of-adjustment in digital radiography?
- a. Decrease in quantum mottle
 - b. increase of contrast
 - c. increase in streak artifact
 - d. increase in quantum mottle
52. The standard Gray Scale Display Function specified by DICOM (Digital Imaging and Communications in Medicine) assists in which of the following?
- a. compressing image size to facilitate image transmission while keeping original gray scale
 - b. increasing gray scale contrast on larger monitors
 - c. eliminating ghost images
 - d. matching the appearance of the image on different electronic displays
53. Which of the following is a possible error that can happen when a digital radiography image is transferred by the acquisition station to the PACS archive?
- a. transmission interruption without notice to the sender
 - b. omission of critical information from the original image
 - c. deletion of the image from local cache
 - d. all of the above
54. Of all the members of the digital radiography quality control team, image quality is the FIRST priority of the _____.
- a. radiology administrator
 - b. clinical engineer
 - c. medical physicist
 - d. lead radiologic technologist
55. According to the quality control task allocation matrix, the verification of display calibrations is conducted by the _____ on a quarterly basis.
- a. lead technologist
 - b. technologist
 - c. clinical engineer
 - d. medical physicist

...End of Test...