

醫學影像資訊管理士測驗

Medical Imaging Information Administrator

2015 年 8 月 30 日星期日

1. 除題意不清楚或是圖片有問題，禁止詢問與試題有關的問題。
2. 應答時禁止使用任何文件。
3. 請在電腦答案卡上圈選作答

項目	填寫內容：
姓名	您的中文與英文姓名
試題名稱	MIIA Test
項目	不用填寫
科目	不用填寫
受試者識別代碼	您的准考證號碼 <u>1**000**</u> 將您選定之數字的圓圈塗滿。
科目代碼	不用填寫
地點代碼	不用填寫
作答方式	本測驗共有 90 題問題。請使用 1 到 90 作答欄位。 請將測驗卷 Q1 的答案填入答案卷的解答番號 1。Q2 = 解答番號 2，Q3 = 解答番號 3...Q90 = 解答番號 90。

Q1. Which of the following is NOT a computer operating system?

- 1) Windows 2000 2) Windows 7 3) UNIX 4) HDD

Q2. Which of the following is a correct terminology for checking whether network is well connected in remote-host or not?

- 1) Telnet 2) Ping 3) FTP 4) Ipconfig

Q3. Choose the appropriate network area for operating in hospital?

- 1) WAN 2) VPN 3) LAN 4) MAN

Q4. Which of the following is a communication protocol for DICOM standard?

- 1) IPX 2) STP 3) tcp/ip 4) NetBEUI

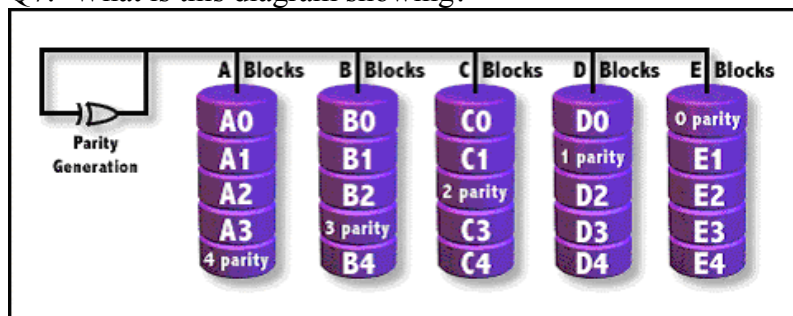
Q5. Which of the following name is to be divided into each modality in PACS?

- 1) Study UID 2) Station name 3) AE title 4) SOP instance UID

Q6. What is a minimum disk number to build a RAID 1 system?

- 1) 1 2) 2 3) 3 4) 4

Q7. What is this diagram showing?



- 1) RAID 0 2) RAID 1 3) RAID 3 4) RAID 5

Q8. Which of the following is the most related to spatial resolution in medical image quality evaluation?

- 1) NPS 2) DQE 3) ROC 4) MTF

Q9. What is the unit of brightness of reading monitor?

- 1) lx/m² 2) cd/m² 3) pm/m² 4) Gx/m

Q10. Which of the following is not acquired from the histogram in digital image?

- 1) The number of pixel at specific intensity 3) Location information at specific pixel
2) Intensity distribution 4) Intensity value of pixel

Q11. Which of the following is NOT necessary for connection modality worklist?

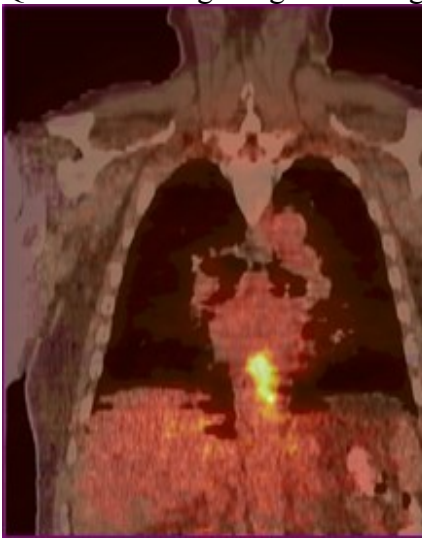
- 1) Examination information 3) Patient information
2) Reading information 4) Operator information

Q12. What header information is described in following *table*?

(0008,0005)	CS	10	Specific Character Set	ISO_IR 100
(0008,0016)	UI	26	SOP Class UID	1.2.840.10008.5.1.4.1.1
(0008,0018)	UI	46	SOP Instance UID	1.3.12.2.1107.5.4.4.0.1
(0008,0020)	DA	8	Study Date	20050707
(0008,0021)	DA	8	Series Date	20050707
(0008,0022)	DA	8	Acquisition Date	20050707
(0008,0023)	DA	8	Content Date	20050707
(0008,0030)	TM	6	Study Time	235839
(0008,0031)	TM	14	Series Time	235839.515000
(0008,0032)	TM	6	Acquisition Time	235839
(0008,0033)	TM	6	Content Time	235839
(0008,0050)	SH	8	Accession Number	80255812
(0008,0060)	CS	2	Modality	CR

- 1) RIS
- 2) HL7
- 3) IHE
- 4) DICOM

Q13. Following image is a merge image of PET and CT. What is image processing technique?



- 1) Pseudocoloring
- 2) Registration
- 3) Rendering
- 4) Subtraction

Q14. Which of the following is NOT caused to noise in medical images?

- 1) Voxel size
- 2) X-ray scatter
- 3) Reconstruction algorithm
- 4) Attenuation coefficient

Q15. Which is the following is proper management of Image Plate?

- 1) Image should be process in less than 24 hours.
- 2) When leave alone long time, erasing work should be operated before exposure.
- 3) Keeping temperate is good to be higher than indoor temperate.
- 4) It take custody of examination room for convenience of using,

Q16. Which is the following is NOT able to make 3D image in modality?

- 1) Computed radiography(CR)
- 2) Computed tomography(CT)
- 3) Magnetic resonance imaging(MRI)
- 4) Ultrasound

Q17. Which of the followings is a proper network term indicating a computer or software which receives service from other devices that are connected to the same network?

- 1) Client
- 2) Server
- 3) DTE (Data Terminal Equipment)
- 4) Gateway

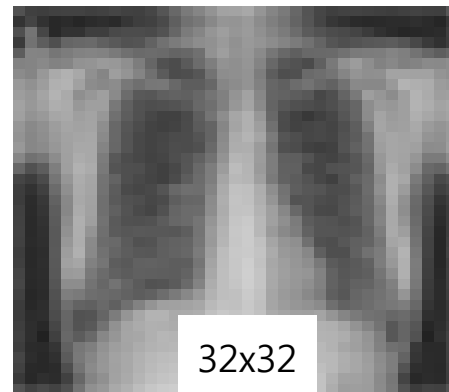
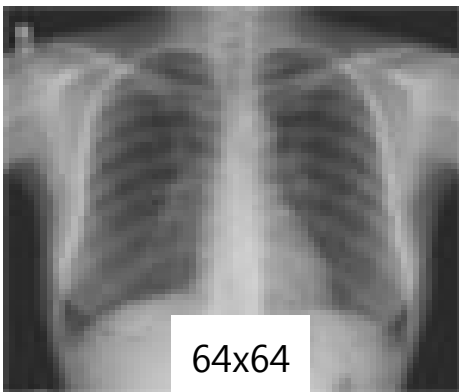
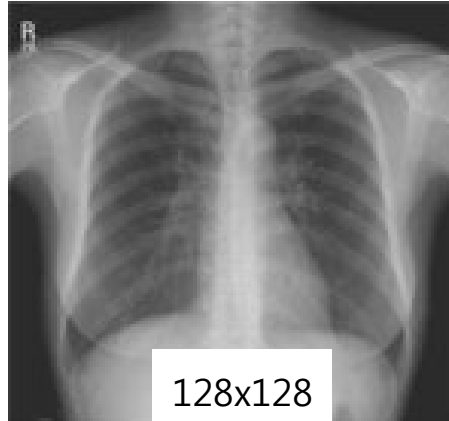
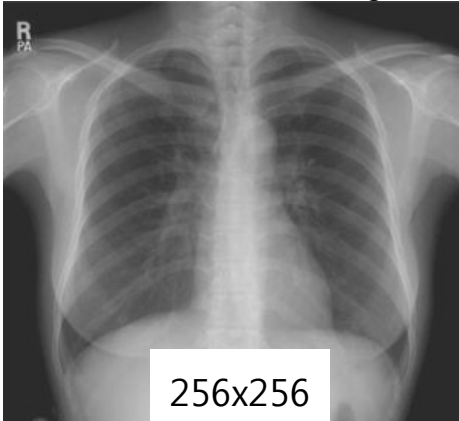
Q18. Which is a network apparatus to prevent an unjust invasion?

- 1) Intranet
- 2) Firewall
- 3) Backbone
- 4) Modem

Q19. Which of the followings is NOT a correct explanation of digital images?

- 1) It expresses a location and brightness of pixels.
- 2) The value of $G(X, Y)$ becomes 0 or 1 when it comes to binary images.
- 3) Pixel is the minimum unit of digital images.
- 4) Digital images arrange pixels one-dimensionally.

Q20. Which of the following is most likely TRUE?



- 1) The change of intensity
- 2) The change of sampling
- 3) The change of quantization
- 4) The change of coding

Q21. Which of the following is NOT used for image *format*?

- 1) JPEG
- 2) MPEG
- 3) ASI
- 4) AVI

Q22. What is the minimum unit for single character in digital?

- 1) 1bit
- 2) 4bit
- 3) 1byte
- 4) 4byte

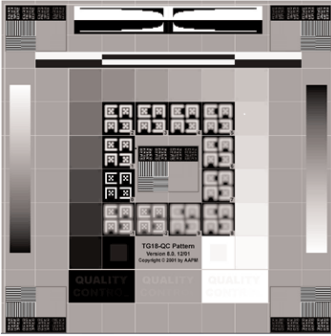
Q23. Which of the following is the most related to noise assessment in medical image quality evaluation?

- 1) MTF
- 2) NPS
- 3) ROC
- 4) DPC

Q24. Which of the following data types is NOT an image type?

- 1) Functional MRI
- 2) Fiber Tractography
- 3) Magnetic Resonance Spectroscopy
- 4) Diffusion Weighted MRI

Q25. Which of following is not an estimation item in this image?



- 1) Artifact
- 2) Luminance response
- 3) Spatial resolution
- 4) Geometric distortion

Q26. Which of the following is working at network of OSI 7 layer?

- 1) Router
- 2) Bridge
- 3) Repeater
- 4) Gateway

Q27. Which of the following is NOT a parameter for a high quality 3-dimensional image?

- 1) Sufficient slice number
- 2) Small pixel size
- 3) Wide z-axis resolution interval
- 4) High temporal resolution

Q28. Which is the part of DICOM security?

- 1) Part 1
- 2) Part 5
- 3) Part 10
- 4) Part 15

Q29. Which of the followings can be estimated from the below picture?



- 1) Uniformity of luminescence
- 2) Accumulated time of use
- 3) Geometrical distortion
- 4) Bit resolution changes

Q30. Which of the following is operated program in application layer of OSI 7 Layer?

- 1) FTP
- 2) UDP
- 3) SNMP
- 4) Ethernet

Q31. What is the cause of the following artifact image?



- 1) clearing with alcohol.
- 2) Anode-Heel Effect.
- 3) overexpose.
- 4) underexpose.

Q32. What is the permanent storage device?

- 1) HDD 2) FDD 3) RAM 4) ROM

Q33. What is the system that make it possible to recover compression image?

- 1) Codec 2) Gateway 3) Decoder 4) Encoder

Q34. What is the process stage that affect contrast resolution in analog to digital?

- 1) Scanning *speed* 2) Sampling 3) Quantization 4) Coding

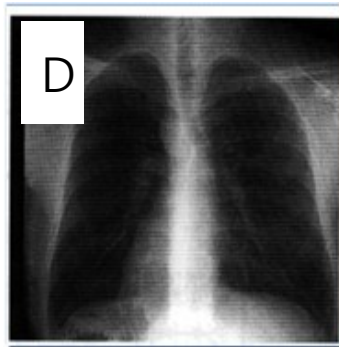
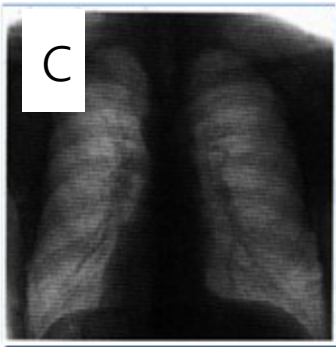
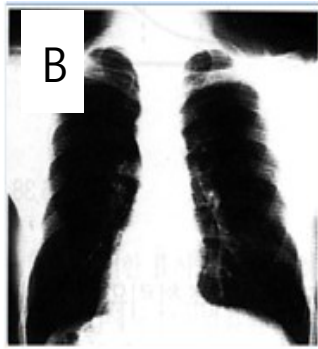
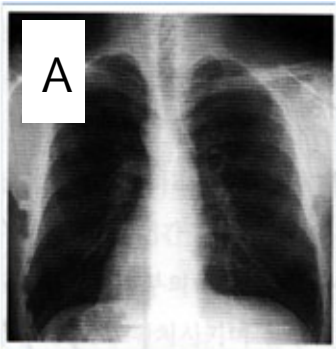
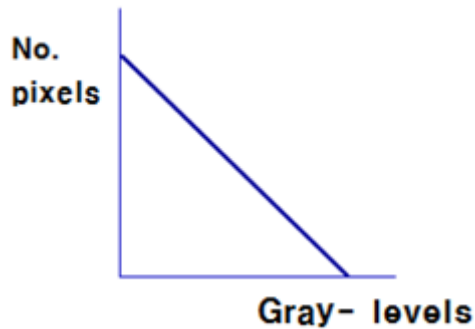
Q35. What does 5 lp/mm mean?

- 1) Black 5 lines in 1mm 2) 5 pixels in 1mm 3) 10 level gray scale in 1mm 4) 10 pixels in 1mm

Q36. Choose the right Nyquist frequency when pixel size is 100 μm ?

- 1) 0.5 lp/mm 2) 1.5 lp/mm 3) 2.5 lp/mm 4) 3.5 lp/mm

Q37. Which image is predictable when set by following Look Up Graph?



- 1) A 2) B 3) C 4) D

Q38. Choose the principle of image compression.

- 1) Liberty 2) Duplication 3) Unpredictability 4) Asymmetry

Q39. Which of the following is NOT a major consideration for management of PACS?

- 1) Preparation of the error 3) Manufacturing process of PACS
2) Security of PACS 4) Real image quality

Q40. Which of the followings is a proper connection device corresponding to UTP cables?

- 1) RG-58 2) RJ-45 3) ST 4) BNC

Q41. It represents an external appearance of subject and connected to pixel over the threshold rendering. What is this?

- 1) SSD (Shaded surface display) 3) MPR (Multi planner reformat)
2) VRT (Volume rendering technique) 4) Virtual Endoscopy

Q42. Which of the followings is NOT the necessary information for synchronization with PACS when the new modality is added?

- 1) IP address 2) Serial number 3) Port number 4) AE Title

Q43. Which of the followings indicates the initial agreement to receive *and send data* between two modalities?

- 1) Association Negotiation 3) Association Release
2) Association Establishment 4) Conformance Statement

Q44. How much is the total data per year if 100GB data occurs per day in the hospital? (Suppose that a month is 20 days.)

- 1) 240 GB 2) 2.4 TB 3) 24 TB 4) 240 TB

Q45. Which of the following is the most appropriate reading-monitor for Mammography?

- 1) 1K monitor 2) 2K monitor 3) 3K monitor 4) 4K monitor

Q46. Where is the best body part for applying High-pass filter?

- 1) Bone and lung 3) White and gray matter
2) Cartilage and muscle 4) Muscle and fat

Q47. Which of the following is CORRECT when the quantization bit rate is changed from 9 bit to 8 bit?

- 1) The volume of image data decreases to 50% 3) The volume of image data decreases to 15%
2) The volume of image data decreases to 25% 4) The volume of image data decreases to 5%

Q48. Which following is NOT related to DICOM Gateway technique?

- 1) Digital Convert technique 3) Secondary Image Capture technique
2) Direct Sender technique 4) Image File DICOM Convert technique

Q49. Which of the following is related to the standard guideline for performance evaluation of medical image in AAPM (American Association of Physicists in Medicine)?

- 1) AAPM Task Group 15 3) AAPM Task Group 17
2) AAPM Task Group 16 4) AAPM Task Group 18

Q50. Which of the following is CORRECT definition about the distance from dot to dot on Monitor?

- 1) Dot Resolution 2) Dot Rate 3) Dot Space 4) Dot pitch

Q51. This compression technique is suitable for the application of telemedicine and proposed to solve the cosine transform limitations. What is this?

- 1) JPEG 3) Wavelet compression
2) MPEG 4 4) Run-Length compression

Q52. Which item best describes a command used to show packet traveling time between hosts?

- 1) tracert 2) ping 3) ipconfig 4) arp

Q53. Which is an equivalent of a 127.0.0.1 network address?

- 1) Ping 2) Remote Desktop 3) Localhost 4) Ifconfig

Q54. Which of the following DICOM tags is most likely used to store patient name?

- 1) (0008,0008) 2) (0010,0010) 3) (0010,0030) 4) (0010,1000)

Q55. In image evaluation, which of the following would be the most basic standard that can meet the requirement of contrast and noise of image?

- 1) DQE (Detective Quantum Efficiency) 3) Resolution
2) MTF (Modulation Transfer Function) 4) Capture Graphic Card

Q56. What is the purpose of this following connector?

- 1) Connect a harddrive to the computer mother board
2) Connecting a network interface card
3) Providing a USB connection
4) Connecting a display card



Q57. What is the number of bit difference between the IPv4 (Internet Protocol version 4) and the IPv6 (Internet Protocol version 6)

- 1) 16 bits 2) 24 bits 3) 64 bits 4) 96 bits

Q58. What is the process that converts continuous signal to discrete signal?

- 1) Pre-processing 2) Post-processing 3) Sampling 4) Quantization

Q59. How many steps in grayscale that can be representing using 10 bits pixel depth?

- 1) 512 2) 1024 3) 2048 4) 4096

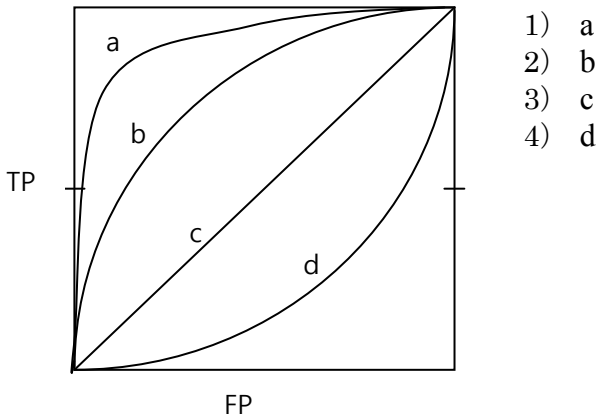
Q60. What tools should be use to protect patient information to comply with HIPPA?

- 1) Antivirus scanners 3) DICOM anonymizers
2) Malware removal tools 4) Firewall

Q61. What RAID level use the technique called “Mirroring”?

- 1) RAID 0 2) RAID 1 3) RAID 3 4) RAID 5

Q62. Which of the following ROC curves is the largest in Az value?



- 1) a
2) b
3) c
4) d

Q63. Which of the following is NOT a characteristic of a computer virus?

- 1) Self-infectious ability 3) Onset ability
2) Latent ability 4) Immune generative ability

Q64. Which of the following is NOT a composition of DICOM Standard?

- 1) PART 2: Conformance 3) PART 8: Security
2) PART 6: Data dictionary 4) Part 14: Grayscale standard display function

Q65. There is a 14-bit 512×512 image. What is the size of image data? (Only, $512 \times 512 = 262144$)

- 1) About 36.7 Kbyte 3) About 45.9 Kbyte
2) About 367 Kbyte 4) About 459 Kbyte

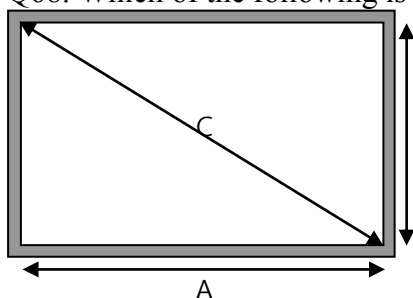
Q66. Choose the ability to express motion organ.

- 1) Spatial resolution 3) High contrast resolution
2) Low contrast resolution 4) Temporal resolution

Q67. Which of the following combinations is FALSE?

- 1) 8bit — 256 3) 12bit — 2048
2) 10bit — 1024 4) 16bit — 65536

Q68. Which of the following is representing the monitor size?



- 1) Length of C
2) Length of $A \times B$
3) Length of $A + B$
4) Length of $A + B + C$

Q69. Which of the following is NOT proper for establishing in PACS server room?

- 1) Thermo hydrostat 2) Sprinkler 3) UPS 4) Telephone

Q70. What is the TAG to know the compression method of DICOM file?

- 1) file meta information version (0002, 0001) 3) transfer syntax UID (0002, 0010)
2) media storage SOP class UID (0002, 0002) 4) SOP instance UID (0008, 0018)

Q71. Which of the following is one of the three elements of information security?

- 1) Safety 2) Integrity 3) Storage 4) Authenticity

Q72. Which explanation of terminology is NOT correct?

- 1) Ping - abbreviation of packet internet gopher
2) SQL - abbreviation of structure question language
3) DB tuning - performance improvement which makes it possible to use system source efficiently as adjusting background parameter
4) DBMS - database management system

Q73. Which of the following is working at network layer of OSI?

- 1) Router 2) Bridge 3) Repeater 4) Gateway

Q74. What bit is 4byte?

- 1) 8bit 2) 16bit 3) 24bit 4) 32bit

Q75. In the data element structure of DICOM data, which is TRUE?

- 1) (0008 , 00010) 2) (001 , 001) 3) (7FE0 , 0010) 4) (00K5 , 0001)

Q76. A malicious program whose aim is to replicate itself to spread to other computers through networks and has a strong reproductive ability. What virus type is it?

- 1) Trojan horses 2) Worms 3) Macro 4) Mutation

Q77. Which is the right IP address?

- 1) 140.124.3 2) 140.35.14.6.3 3) 258.24.38.166 4) 168.95.7.21

Q78. Which of following is NOT Transfer Syntax for DICM?

- 1) Implicit VR little Endian 3) JPEG Lossless
2) Explicit VR Big Endian 4) Implicit VR Big Endian

Q79. Which of the following is NOT DICOM Message Service Element(DIMSE)?

- 1) C-store 2) C-get 3) N-store 4) N-get

Q80. Which of the following is NOT included Hub?

- 1) Dummy 2) Intelligent 3) Switching 4) Full Duplex

Q81. What is the process that converts continuous signal to discrete signal?

- 1) Pre-processing 2) Post- processing 3) Sampling 4) Quantization

Q82. Which of the following is NOT an influence on MTF?

- 1) Tube voltage 3) Source-Image 4) Pixel size
2) Focus size Distance (SID)

Q83. Which of the following is FALSE describing that SSL

- 1) is a protocol which encrypts and sends information.
- 2) encrypts web data by http.
- 3) combines security technologies such as a public key and a digital certificate.
- 4) is able to prevent data sniffing , fabrication, and spoofing.

Q84. Which of the following is changed from origin intensity distribution of pixel to uniformity intensity distribution in an image?

- 1) Histogram Equalization
- 2) Unsharp mask subtraction
- 3) Interpolation
- 4) Threshold technique

Q85. What is NOT the condition of NMS (Network Management System)?

- 1) Organization
- 2) Efficiency
- 3) Virus
- 4) Malfunction

Q86. Which of the following corresponds to a 5:4 display aspect ratio?

- 1) XGA
- 2) SXGA
- 3) UXGA
- 4) QXGA

Q87. This sever is able to connect directly to the images by internet regardless of computer or operation system. What is this?

- 1) DB server
- 2) Web server
- 3) UNIX server
- 4) NT server

Q88. Which of the following is used for erasing latent image in CR modality?

- 1) Blue laser
- 2) White laser
- 3) Semiconductor laser
- 4) Visible light

Q89. Which is the RAID technique to have two parity?

- 1) RAID 0
- 2) RAID 1
- 3) RAID 5
- 4) RAID 6

Q90. Which is NOT as network topology?

- 1) Star
- 2) Ring
- 3) Angle
- 4) Bus / Tree