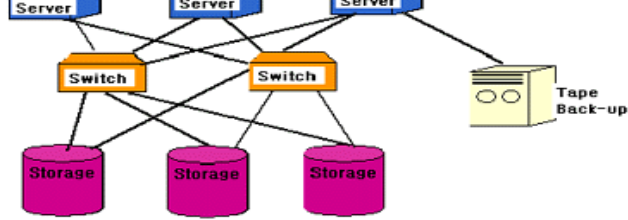


問題 1

- 1.()下列何者為奈奎斯特頻率(Nyquist frequency)的正確描述？
1. 奈奎斯特頻率(f_0) = 最高影像頻率 2. 奈奎斯特頻率($2f_0$) = 最高影像頻率 \times 2
3. 奈奎斯特頻率($1/f_0$) = $1/\text{最高影像頻率}$ 4. 奈奎斯特頻率($f_0/2$) = 最高影像頻率/2
- 2.()一部影像伺服器利用 5 個 200GB 的磁碟，組成容錯陣列磁碟系統 5 (RAID 5)。請問可用來儲存資料的實際容量為多少(GB 計)？ 1. 1000 [GB] 2. 800 [GB]
3. 400 [GB] 4. 200 [GB]
- 3.()關於增加 X 光偵測器 S/N 比的方法，下列何者錯誤？
1. 改善閃爍體交換 X 光光子的效率。2 改善閃爍體與光源偵測器之間的緊密度，並提高傳導率。3 減少光電二極管的有效感測面積。4 控制偵測器產生的雜訊。
- 4.()造影設備欲送出影像至影像伺服器時，需要下列何者？
1 查詢/取得服務層級使用者(SCU) 2 查詢/取出服務層級提供者(SCP)
3 儲存用 SCU 4 儲存用 SCP
- 5 ()將硬體組件裝入電腦後，下列何者能讓使用者使用各硬體組件？
1. 硬碟 2. 開道 3 Windows NT 4 Linux
- 6 ()關於「醫學影像儀器與軟體共同通訊規格(DICOM)」的說明，下列何者錯誤？
1 其規格亦與輸出底片相容。2 每隔五年重新審核 DICOM 規格。3 每部 DICOM 相容儀器，都附上 DICOM 相容性聲明書。
1. 僅有 1 正確 2. 僅有 2 正確 3. 僅有 3 正確 4 以上皆非
- 7()叫出壓縮影像後，就數理上而言，下列何者等於壓縮前影像？
1. JPEG 2. JPEG2000 3. MPEG 4. 變動長度編碼(Run-Length)
- 8()下列何者正確說明了醫療企業整合測試計畫(IHE)？
1 全球已有 128 國成立委員會。2 委員會每兩年進行示範測試，此項測試名為 Connectathon。3 一旦順利完成 Connectathon 示範測試，就能確保全球醫療機構的相容性。
1. 僅有 1 正確 2. 僅有 2 正確 3. 僅有 3 正確 4. (1、2 與 3 都錯)
- 9()欲呈現數字 1 至 8，需要多少位元(bit)？
1. 1 bit 2. 2 bits 3. 3 bits 4. 4 bits
- 10()假設在更新斷層掃描(CT)裝置時，您打算新購一部影像伺服器，請問在計算欲購影像伺服器所需的容量時，下列何者錯誤？
A. 如果影像產生數因檢驗部位而異，則按照各部位算出容量。B. 如果新購的斷層掃描裝置預定使用九年，應按照同樣使用九年的條件下，算出影像伺服器的容量。
C. 如果採無損壓縮儲存，則將影像壓縮度設定為 1 來計算。D. 按照實際用途算出的預計容量，應保有一些容許誤差。
1. A 和 B 錯誤 2 B 和 C 錯誤 3. A 和 D 錯誤 4. C 和 D 錯誤
- 11()下列何者能呈現所有英文字母？1. 1 bit 2. 4 bits 3. 1 byte 4. 4 bytes
- 12()關於網路連結儲存(NAS，一種伺服器連結類型)，下列何者錯誤？
1.網路負載量龐大。2.易於連結追加。3.易於分享檔案，即使雙方作業系統不同亦然。
1. 僅有 1 錯誤 2. 僅有 2 錯誤 3. 僅有 3 錯誤 4. 以上皆非(1、2 與 3 都正確)
- 13()下列哪一選項所列的方法，以量化形式來評估數位影像品質？ ① 薄膜電晶體(TFT)
② 像素 ③ 淡出/淡入(Fading) ④ 調製傳遞函數(MTF) ⑤ 量子效率(DQE)
1 ①、② 2 ②、③ 3 ④、⑤ 4. ③、④、⑤

- 14()下列哪項算式錯誤？
1. 4 bits=1 nibble 2. 10 bits=1 byte 3. 2^{30} B=1 GB 4. 2^{40} B=1 TB
- 15()下列哪項組件是整合多重部分以將資料存入硬碟的基本組件？
1. 軌 2. 叢聚 3. 圓筒(Cylinder) 4. 區
- 16()若將新伺服器增至伺服器機房，下列哪項數值受到的影響最小？
1. 伺服器發熱值 2. 伺服器所需電力 3. 伺服器產生的雜訊 4. 安置伺服器的面積
- 17()下列何者用來填滿中央處理器與主要記憶體之間的容量差距？
1. 綜合儲存體 2. 虛擬儲存體 3. 快取記憶體 4. 快閃記憶體
- 18()關於影像日期壓縮法的描述，下列何者錯誤？
1. 一般以預測差值編碼做為無損壓縮，以利進行預測誤差資訊的霍夫曼編碼。
2. 插值編碼不損及空間解析度，所以能獲得自然影像。3. 向量量化法是呈現量化用影像區塊的方法，可能造成畫素損失。
1. 僅有 1 錯誤 2. 僅有 2 錯誤 3. 僅有 3 錯誤 4. 以上皆非(1、2 與 3 都正確)
- 19()下列哪項儲存裝置需要最快的資料輸入/輸出率？
1. 短期儲存裝置 2. 中期儲存裝置 3. 長期儲存裝置 4. 備份儲存裝置
- 20()關於影像壓縮的敘述，下列何者錯誤？
1. 無損壓縮能確保影像原有品質。2. 有損壓縮無法保證影像品質，卻能縮小檔案容量。3. JPEG 壓縮能將高畫質檔案的容量，壓縮至小於低畫質檔案的容量。
1. 僅有 1 錯誤 2. 僅有 2 錯誤 3. 僅有 3 錯誤 4. 以上皆非(1、2 與 3 都正確)
- 21()下列哪項裝置用來連接架構不同的網路，並改變其原有的作業系統七層應用模型(OS-model seven-layer application)？
1. 閘道 2. 再生器 3. 路由器 4. 橋接器
- 22()關於公開金鑰基礎建設(PKI)的敘述，下列何者錯誤？
1. PKI 能透過認證機構核發的公開金鑰證明，擔保公開金鑰持有人的身分。 2. 政府機構公開金鑰基礎建設(GPKI)是政府機關在人們向其申請時的授權依據及必備項目。 3. 認證機構屬於 PKI 的民間服務之一。 4. 此認證用來辨識使用者/伺服器身分、加密資料並確認資料是否完整等。
- 23()下列哪項資訊與健康資訊交換第七層協定(HL7)的訊息範圍最不相關？
1. 加入、釋出、轉移(ADT)資訊 2. 藥單輸入資訊 3. 影像取得資訊 4. 患者治療資訊
- 24()關於顯示器的對比率，下列何者為真？
1. 意指亮房內最亮與最暗顏色的明度比。 2. 意指暗房內最亮與最暗顏色的明度比。
3. 意指亮房內最亮與最暗顏色的明度平衡值。4. 意指暗房內最亮與最暗顏色的明度平衡值。
- 25()下列何者對影像顯示速度的影響最小？
1. 中央處理器(CPU) 2. 影像卡 3. 記憶體 4. 顯示器更新率
- 26()下列哪種電纜一般用於 1000 BASE-T 網路？
1. 第 1 類電纜 2. 第 3 類電纜 3. 第 4 類電纜 4. 第 5e 類電纜
- 27()採用 SMPTE 測試法檢驗醫學影像顯示器時，下列哪項測試項目最為不當？
1. 50% APL 樣式 2. 橫傳樣式(Cross Pass Pattern) 3. 雜訊 4. 灰階
- 28()下列哪項稽核紀錄與伺服器登入或刪除資料有關？
1. 存取紀錄 2. SSL 傳輸加密紀錄 3. 認證權限 4. IP 安全協定



1. DAS 2. NAS 3. SAN 4. DRS

30()關於中繼式集線器(repeater hub)的說明，下列何者錯誤？

- 1 中繼式集線器將一埠口接收的封包資訊，傳送至另一埠口。 2 中繼式集線器能分析封包資訊並控管寄送者。 3 中繼式集線器亦能用來延伸網路。 4 中繼式集線器具有修正與加強波形的功能。

31()下列哪種資訊傳輸媒體的波長最寬、傳輸率最快、位元誤差最少？

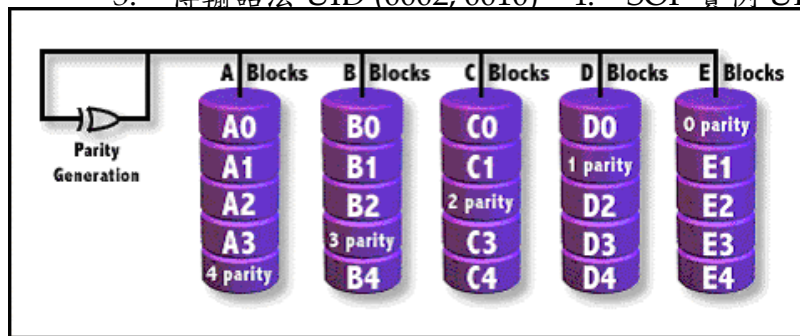
1. 屏蔽雙絞線電纜 2. 無屏蔽雙絞線電纜 3. 同軸電纜 4. 光纖電纜

32()請選出新一代網路協定第 6 版(IPv6)的位址空間。

1. 32 bits 2. 64 bits 3. 128 bits 4. 256 bits

33()下列哪種標籤(TAG)描述了是否能利用 DICOM 壓縮檔案，以及採用何種方法？

1. 檔案 Meta 資訊版本(0002, 0001) 2. 媒體儲存體 SOP 等級 UID (0002, 0002)
3. 傳輸語法 UID (0002, 0010) 4. SOP 實例 UID (0008, 0018)



負載量。 2 交換集線器具備橋接器的功

3. 以上皆非(1、2 與 3 都正確)

1. RAID 2. RAID 1 3. RAID 3 4. RAID 5

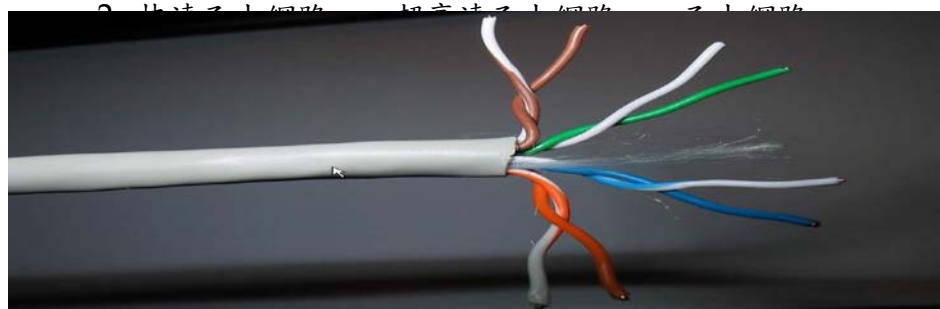
36()請選出最契合以下敘述的伺服器連結類型。

用來連接含光纖頻道網路之儲存裝置的伺服器連結類型：

1. DAS 2. SAN 3. CAS 4. NAS

37()下列哪一選項為傳輸率最快到最慢的正確順序？

1. 超高速(Gigabit)乙太網路 → 快速乙太網路 → 乙太網路



代表的意義？

1. 屏障雙絞線電纜 2. 無屏障雙絞線電纜 3. 同軸電纜 4. 光纖電纜

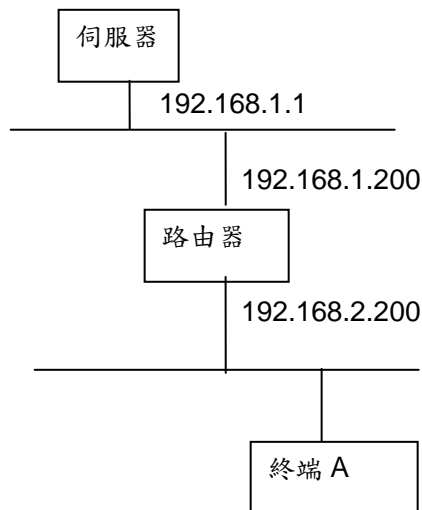
40()就網路連結而言，下列哪種網路連結形式所具的自由度最高？

1. 匯流排構成的區域網路 2. 星形區域網路 3. 環形區域網路 4 以上皆非

41()下列何者的 DICOM 開道系統不同於其他選項？

1. 數位轉換器 2. 綜合轉換器 3. RGB 4. S-VHS(Super VHS)

42()請問哪一選項符合以下網路圖所示，並將終端 A 接至伺服器？



1. 終端 A 的 IP 位址：192.168.1.2 預設閘道：192.168.1.200
2. 終端 A 的 IP 位址：192.168.1.2 預設閘道：192.168.2.200
3. 終端 A 的 IP 位址：192.168.2.2 預設閘道：192.168.1.200
4. 終端 A 的 IP 位址：192.168.2.2 預設閘道：192.168.2.200

43 ()關於數位放射線攝影(DR)的敘述，下列何者錯誤？

- 1 利用增感屏取得影像。
- 2 利用影像板(IP)或電腦放射線攝影(CR)讀取機取得影像。
- 3 利用螢光屏與電荷耦合元件(CCD)取得影像。 利用具 TFT 的平板偵測器取得影像。

44()關於網路指令「tracert」的敘述，下列何者錯誤？

- 1 能追蹤 IP 位址與網路路徑。
- 2 在網路中斷時顯示「逾時」訊息。
- 3 能瀏覽連接至網路各區的所有終端。
- 4 顯示路徑上的 L3 交換集線器。

45()請問哪種醫療用影像傳輸網路系統(PACS)伺服器，與 DICOM 工作清單最為相關？

1. 備份伺服器
2. 影像伺服器
3. 資料庫(DB)伺服器
4. 獲取伺服器(Acquisition Server)

46()原本可見的患者 A 影像，如今無法在影像顯示終端機上呈現。關於此問題的起因，下列何者可能錯誤？

- 1 患者 A 的影像沒有存入影像伺服器。
- 2 搜尋條件出錯。
- 3 影像解析度不同於顯示器解析度。
- 4 使用者 ID 不具瀏覽權限。

47 下列何者的資料輸入/輸出率最快？

1. 快閃記憶體磁碟
2. 硬碟
3. 可讀寫光碟機(MO Disk)
4. 開放式線性磁帶機

48()關於電腦防毒作業的敘述，下列何者錯誤？

- 1 定期更新防毒軟體的病毒碼。
- 2 區隔網際網路與商用網路。利用 USB 記憶體的檔案來操作各終端。
- 3 使用無線區域網路時，能使用有線等效保密(WEP)與 Wi-Fi 保護存取協定(WPA)以確保操作安全。
- 4 定期升級作業系統以消除安全漏洞。

49()下列何者屬於 DICOM 基本裝置？

1. DICOM 訊息服務元件
2. 服務層級使用者(SCU)
3. 服務物件組(SOP)
4. 資訊物件定義(IOD)

50()關於健康資訊交換第七層協定(HL7)的敘述，下列何者錯誤？

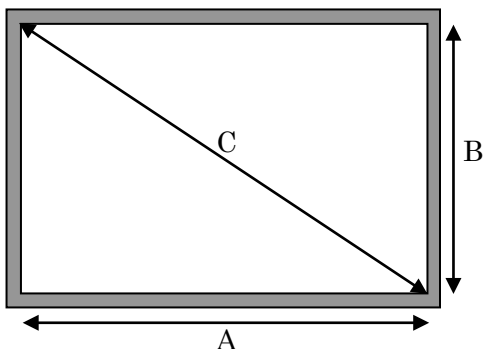
- 1 這是交換醫療資訊的標準規則。
- 2 各部門均以直線(|)區分。
- 3 此項協定處理了影像資料、客戶管理、藥單和檢驗報表的資訊交換事宜。
- 4 此項協定源自醫療資訊系統之間的

七十層 ISO-OSI 層應用。

- 51()下列代表螢幕產生速度的選項中，何者意指螢幕在一秒內重新寫入影像的頻率？
 1. 解析度 2. 更新率 3. 亮度 4. 點距
- 52()下列哪項建檔數據，最適合下表所示的 DICOM 資料結構？

組號	元件編號	呈現資料	資料長度	建檔數據
0008	0020	DA	8	*****

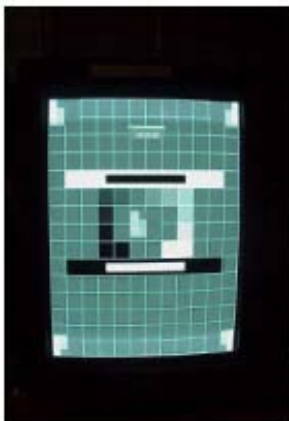
1. 26/Nov/06 2. 20061126 3. 00141525 4. PM 02:15:25
- 53()關於網路配置的用途，下列哪項敘述最適當？
 1 藉由分享資源以交換資訊。 2 促進機密資訊管理。 3 能利用網際網路。
 4 改善電腦處理速度。
- 54()關於服務層級使用者(SCU)與服務層級提供者(SCP)的敘述，下列何者為真？
 1 SCU 是要求每項 DICOM 服務的裝置。 2 SCP 是要求每項 DICOM 服務的裝置。
 3 單一裝置無法同時支援同一服務層級的 SCU 與 SCP。 4 DICOM 傳輸作業一定有 SCU 與 SCP。
- 55()欲呈現 256 階對比解析度，需要多少位元？
 1. 2 bits 2. 4 bits 3. 8 bits 4. 16 bits
- 56()從造影設備送出影像至 DICOM 影像伺服器時，需要將哪項 UID 放入標籤？
 1. 造影設備實例 UID 2. 序列實例 UID 3. 影像實例 UID 4. 對比實例 UID
- 57()根據 AAPM TG-18，三段式測試法共規範了八項測試項目。請問下列何者不屬於其中之一？
 1. 目視 2. 量化 3. 進階 4. 準確度
- 58()關於「相關性(association)」的敘述，下列何者為真？
 1 意指在交換 DICOM 實際資料前的傳輸確認。 2 意指從資料接收者至寄送者的通報傳輸，旨在通知透過 DICOM 儲存器收到影像。 3 意指將接收自外部裝置的影像，自動送至另一部裝置的傳輸作業。 4 意指將 DICOM 資料寫入 HDD 或 DVD 等媒體的服務層級。
- 59()下列何者最能說明下圖所示的顯示器尺寸？



1. $A \times B$ 2. $A+B$ 3. C 4. $A+B+C$
- 60()下列 DICOM 標籤中，何者屬於隱私標籤？
 1. (0010,0020) 2. (0029,1031) 3. (0040,1010) 4. (7FE0,0010)
- 61()下列何者最不適合用來檢查醫療影像顯示？
 1. 變形度 2. 空間解析度 3. 環境 4. 網路封包查詢測試(Ping Test)

- 62()將影像以 DICOM 格式存入可寫入光碟片(CD-R)時，下列何者最為相關？
1. DICOM DIR 2. 造影設備工作清單(Modality Work List) 3. 檔案轉換協定
4. 儲存服務層級
- 63()下列何者為色階分佈圖的定義？
1 以圖示呈現影像所具的畫素數。 2 以圖示呈現影像所具的畫素位置。 3 以柱狀圖顯示影像所具的畫素密度值。 4 以圖示呈現影像所具的密度分佈。
- 64()下列何者為光源產生的光線通過液晶螢幕(LCD)、再抵達雙眼的正確路徑？
(A：偏光鏡 B：玻璃板 C：透明電極)
1. 光源→A→B→C→液晶螢幕→C→B→A→雙眼
2. 光源→B→A→C→液晶螢幕→C→A→B→雙眼
3. 光源→A→C→B→液晶螢幕→B→C→A→雙眼
4. 光源→B→C→A→液晶螢幕→A→C→B→雙眼
- 65()下列何者為十進位數字15轉換而成的二進位數字？
1. 1111 2. 1011 3. 1001 4. 1101
- 66()關於數位化優點的敘述，下列何者錯誤？
1 數位訊號可以採數位化處理，其雜訊低於類比訊號。 2 乳腺領域有種協助診斷的系統，運用了數位訊號的優點。 3 對影像診斷的發展貢獻良多，因為不存於原始資料內的病理變化，在經過處理以移除頻率與雜訊後，就能另外顯示出來。
1. 僅有 1 錯誤 2. 僅有 2 錯誤 3. 僅有 3 錯誤 4. 以上皆非(1、2 與 3 都正確)
- 67()一部 RAID 利用 4 個 250GB 的硬碟組成。在此情況下，實際儲存容量若約 700GB，其 RAID 層級為多少？
1. RAID 0 2. RAID 1 3. RAID 0+1 4. RAID 5
- 68()關於醫療用顯示器的不變性檢定及準確度控制敘述，下列何者錯誤？
1 使用亮度計進行校正，以求恢復最大明度及中間調色層。 2 有些清晰度高的液晶螢幕，內建亮度計以控制明度。 3 每天應進行四次不變性檢定，即使是細微變化也不容忽視。
4 亮度計和照度計都是監測安裝地點四週環境的必備裝置。
- 69()下列何者不是數位影像的訊號值？
1. 序列訊號 2. 單值 3. 樣本值 4. 平均值
- 70()欲觀察胸部斷層掃描圖(CT)的肺部區域，下列何者為合適的視窗寬度/視窗階(WW/WL)？
1. WW250 / WL30 2. WW512 / WL30 3. WW1500 / WL600 4. WW4000 / WL600
- 71()請問在影像數位化過程中，編碼階段採用下列何種單位？
1. Hz 2. byte/sec 3. byte 4. bit
- 72()關於 DICOM 列印指令(DICOM Print)的敘述，下列何者錯誤？
1 這是從雷射影像記錄儀輸出影像至底片上的服務層級。 2 意指做為服務層級使用者(SCU)的雷射影像記錄儀功能。 3 DICOM 列印指令主要來自造影設備或影像瀏覽器。
4 DICOM 列印指令的下令裝置，同於 DICOM 列印用 SCU。
- 73 下列哪項過程得以將影像中的連續密度組，轉換成擴散密度值？
1. 量化 2. 掃描 3. 影像壓縮 4. 影像重組
- 74()假設醫院每天製作 10GB 的影像，一年將製作多少影像(每月工作日共計 20 天)？
1. 240 [GB] 2. 2.4 [TB] 3. 24 [TB] 4. 240 [TB]

- 75()欲利用間接轉換(X光光子→光源光子→數位訊號)取得影像時，下列何者為最佳選擇？
 ① S/F(螢幕/底片) ② DR(直接數位放射線攝影) ③ DR(間接數位放射線攝影)
 ④ CR(電腦放射線攝影)
 1. ①、② 2. ②、③ 3. ②、③、④ 4. ③、④
- 76()關於中央處理器(CPU)的敘述中，下列何者錯誤？
 1 這是統一處理資料的裝置。2 這是執行記憶體所存程式的裝置。3 每項指令處理的資料量，端視中央處理器容量而異。4 每秒執行的指令數，可以用位元來表示。
- 77()下列何者為讀取電腦放射線攝影(CR)影像的最佳選擇？
 1. 藍光雷射 2. 白光雷射 3. 半導體雷射 4. 可視光
- 78()關於 AAPM TG-18 的敘述，下列何者錯誤？
 1 指定色彩測試用的影像。2 內含驗收測試方針。3 說明灰階標準顯示函數(GSDF)容限。
 1. 僅有 1 錯誤 2. 僅有 2 錯誤 3. 僅有 3 錯誤 4. 以上皆非(1、2 與 3 都正確)
- 79()下列哪種方法能在不損及影像品質下，接收到準確的訊號？
 1. DR (直接數位放射線攝影) 2. DR (間接數位放射線攝影) 3.S/F (螢幕/底片)
 4. DRF (數位放射線攝影/螢光鏡透視)
- 80()冠狀動脈血管攝影術以每秒 15 框的速度進行十分鐘。請問大約產生多少張影像？
 1. 50 張影像 2. 100 張影像 3. 150 張影像 4. 200 張影像
- 81()下列哪種 RAID 類型屬於「磁碟鏡射」，意指將資料存入兩個以上的磁碟以改善容錯率？
 1. RAID 0 2. RAID 1 3. RAID 4 4. RAID 5
- 82()假設醫療用顯示器具備五百萬像素，請問平均解析度為多少？
 1. 2048×2560 2. 1600×3072 3. 1200×4096 4. 1024×4960
- 83()下列何者為壓縮患者病歷一類書面文件的適當方法？
 1. JPEG 2. G3/G4 3. MJPEG (Motion JPEG) 4. MPEG
- 84()下列何者為以 TR 500 ms、TE 20 ms 拍攝的核磁共振(MR)影像？
 1. T1 加權影像(T1-weighted image) 2. T2 加權影像(T2-weighted image)
 3. FLAIR 影像 4. T2*加權影像(T2*-weighted image)
- 85()國際標準組織(ISO)界定了網路控管系統必須完成的網管功能。請問下列何者未納入 ISO 的定義之中？ 1. 故障管理 2. 會計管理 3. 基礎設施管理 4. 安全管理
- 86()檢查影像中的 DICOM 標籤時：列像素為(0028,0010)：256；欄像素為(0028,0011)：256；每像素的位元數為(0028,0100)：16。請問此張影像的大小為多少？
 1. 約 57 kbytes 2. 約 131 kbytes 3. 約 524 kbytes 4. 約 1048 kbytes
- 87()下列何者與造影設備工作清單最不相關？



絡資料 4. 存取編號

下列哪項敘述錯誤？

了彩色影像中的血流方向。

色呈現接近欲選區域(ROI)的血流。

。

九倍。

1. 照明器校正 2. 病毒檢查 3. 顯示器校正 4. 伺服器檢查

90() 請問哪一選項最契合以下敘述？

將於電腦斷層影像(CT)裝置輸入患者資料時，詢問放射線資訊系統(RIS)伺服器以取得患者資料。

1. MWM (造影設備工作清單管理) 2. MPPS (造影設備執行程序步驟)
3. GPWM (一般用途工作清單管理) 4. GPPPS (一般用途執行程序步驟)

91(2) 醫療機構電子病歷製作及管理辦法是依照何種母法訂出？

1 放射師法第 28 條。 2 醫療法第 69 條。 3 醫師法第 24 條。 4 護理師法第 25 條。

92(3)) 台灣 DICOM 標準之訂定是由何機構訂定之？

1 衛生署 2 原委會 3 經濟部標準檢驗局 4 公平會

93(3)) 醫療資訊通信協定第七層(HL7) 標準之訂定是由何機構訂定之？

1 衛生署 2 原委會 3 經濟部標準檢驗局 4 公平會

94(3)) 得免另以書面方式製作之電子病歷應符合何種法規行之？

1 醫療法 2 醫師法 3 醫療機構電子病歷製作及管理辦法 4 電子簽章法

95(1) 醫療機構電子病歷製作與管理辦法第五條規定醫事憑證證照費之費額由何機關定之？

1 衛生署。 2 縣市衛生局。 3 各醫院。 4 經濟部。

96(4)) 醫療機構電子病歷製作與管理辦法第五條規定醫事憑證證照費之費額是依何法規定之？

1 放射師法第 28 條。 2 醫療法第 69 條。 3 醫師法第 24 條。 4 規費法第 10 條。

97(3)) 電子簽章法主管機關為

1 內政部 2 財政部 3 經濟部 4 交通部

98(1) 醫療法第七十一條，醫療機構提供病歷複製本，下列何者為非：

1 醫療機構應依其診治之家屬要求。 2 必要時提供中文病歷摘要。

3 不得無故拖延或拒絕。 4 其所需費用，由病人負擔。

99(2) 醫療「影像交換」的機制，現階段是由何機關主導建立？

1 放射師公會全聯會。 2 衛生署健保局。 3 醫師公會全聯會。 4 縣市衛生局。

100(3)) 醫療機構電子病歷之製作及貯存，應符合何種法規行之？

1 醫療法 2 醫師法 3 醫療機構電子病歷製作及管理辦法 4 電子簽章法

問題 1：下列何者為二進位數(binary numeral)「1111」的十六進制(hexadecimal)表示法？

1. E 2. F 3. 11 4. 1A

問題 2：下列何者為電腦使用 0 與 1 表示法進行運算的最小資訊單位？

- 1.位元組(byte) 2.半字節(nibble) 3.位元(bit) 4.千位元組(KB)

問題 3：何種資料元件的輸入/輸出處理單位是以 SI 為字首？

- 1.位元組(byte) 2.欄位(field) 3.記錄(record) 4.檔案(file)

問題 4：為了表示 1 至 12 的數字，需要多少位元(bit)？

1. 1 位元 2. 2 位元 3. 3 位元 4. 4 位元

問題 5：多少位元(bytes)正好可組成十億位組(gigabytes)？

1. 1024 2. 1024 × 1024 3. 1024 × 1024 × 1024 4. 1024 × 1024 × 1024 × 1024

問題 6：何種字元編碼方案(encoding scheme)的碼長為 1 位元？

- 1.美國訊息互換標準程式碼(ASCII)
2.擴展 UNIX 編碼(EUC)
3.單一編碼(Unicode)
4.日本即時作業系統(TRON)

問題 7：哪一個網路術語，指的是在分散資料處理系統下，從另一個網路設備接收服務的電腦或軟體？

- 1.用戶端(Client) 2.伺服器(Server) 3.資料終端設備(DTE) 4.閘道器(Gateway)

問題 8：下列哪種是 UNIX 公開程式碼之作業系統？

- 1.Windows 2.DOS 3.Linux 4.OS/2

問題 9：下述何者不屬於作業系統(OS)？

- 1.DOS 2.Windows 3.UNIX 4.Active X

問題 10：何種介面可連結至標示 RJ-45 的發信站(site labeled RJ-45)？

- 1.Serial port 2.Analogue monitor 3.USB 4.LAN cable

問題 11：下述何者為平行介面？

1. USB 2. SCSI 3. IEEE1394 4. RS-232C

問題 12：下述關於 RAM (隨機存取記憶體)與 ROM (唯讀記憶體)的敘述，何者明顯有誤？

1. RAM 可在任何地方寫入程式與資料。
2. ROM 可讀取寫入的資料，但無法刪除寫入的資料。
3. ROM 與 RAM 為非揮發性儲存裝置(nonvolatile storage devices)。
4. 「主要儲存體」(primary storage)一般是由 ROM 與 RAM 所組成。

問題 13：關閉電源時，下述何者會流失記錄的資訊？

- 1.RAM(隨機存取記憶體) 2. FDD(軟碟機) 3.ROM(唯讀記憶體) 4.HDD (硬碟機)

問題 14：何種儲存媒體(storage medium)使用雷射進行資料的讀寫？

1. ZIP disk 2.光碟 3.Flash memory 4. Smart-media card

問題 15：下述何者為可覆寫式儲存媒體？

1. DVD-ROM 2. DVD-R 3. DVD+R 4. DVD-RAM

問題 16：下述何者並非光學媒體(optical medium)？

- 1.Zip 2.MO 3.CD-R 4.DVD-ROM

問題 17：下述何者為使用網際網路的虛擬私有網路服務？

- 1.WAN 2.VPN 3.ASP 4.ISP

問題 18：以 10 吋× 8 吋之大小，顯示 640×400 之數位影像時的解析度為何？

1. 64 mm × 50 mm 2. 64 ppi × 50 ppi 3. 64 lx × 50 lx 4. 64 Hz × 50 Hz

問題 19：下述關於「7,200 轉」硬碟(7,200 rpm)的描述，何者正確？

- 1.磁碟機轉速為每分鐘 7,200 轉。
- 2.平均存取時間(mean access time)為 7,200 微秒(ms)。
- 3.寫入資料的最大速度為每分鐘 7.2 GB (十億位元組)。
- 4.擁有 7,200 個磁區(sectors)的硬碟。

問題 20：下述描述最可能的描述對象為何？「可簡易搜尋並擷取儲存的資料」

- 1.資料庫(Database)
- 2.儲存裝置(Storage device)
- 3.伺服器裝置(Server device)
- 4.開放式線性磁帶機(LTO)

問題 21：下述何者並非使用個人電腦(PC)或醫療影像擷取與傳輸系統(PACS)的輸出裝置？

- 1.雷射印表機 2.喇叭 3.陰極射線管螢幕(CRT Monitor) 4.數位轉換器(Digitizer)

問題 22：下述何種作業程序可將「空間與時間上的連續數值」轉換為「離散數據點」(discrete points)的組合？

- 1.抽樣(Sampling)
- 2.量化(Quantization)
- 3.類比—數位轉換(DA conversion)
- 4.醫學數位影像及通信標準轉換(DICOM conversion)

問題 23：醫學影像中一般使用的量化位階(level of quantization)為何？

1. 4~10 位元 2. 6~10 位元 3. 8~16 位元 4. 10~24 位元

問題 24：下列關於圖形資料壓縮的敘述，何者正確？

- 1.霍夫曼編碼(Huffman encoding)是一種無失真壓縮法(lossless compression method)。
- 2.無失真壓縮比失真壓縮(lossy Compressions)產生之圖形資料，佔用較小的磁碟區。
- 3.壓縮後的影像將比原始影像具有較高的解析度。
- 4.使用 JPEG 格式的無失真壓縮，可將資料的磁碟區降低至 1/300 左右。

問題 25：以 WAVELET 壓縮方式為基礎之 JPEG 最新版本為何？

- 1.MPEG 2.JPEG 2000 3.Motion JPEG 4.JPG

問題 26：下述關於 JPEG2000 的敘述，何者有誤？

- 1.比 JPEG 擁有較高的影像壓縮比與更佳的品質。
- 2.是以離散餘弦轉換(discrete cosine transform)進行量化(quantization)與編碼(encoding)的一種壓縮法。
- 3.可使單一圖形資料轉換為不同解析度的影像。
4. JPEG2000 也是一種無失真壓縮。

問題 27：下列何者並非圖形資料的壓縮格式？

1. TIFF 2. MP3 3. GIF 4. JPEG

問題 28：下列何者與失真壓縮的關聯性最小？

1. 離散餘弦轉換(DCT)
2. 音訊裝置之音源等化器(band equalizer)的原理
3. 追求完美的圖形資料壓縮
4. 依資料傳輸之重要性排序，對齊資料

問題 29：下述關於低通濾波(low-pass filtering)的敘述，何者有誤？

1. 執行低通濾波可消除高頻元件(high-frequency components)。
2. 執行低通濾波具有平滑化的效果。
3. 執行低通濾波可消除低頻元件(low-frequency components)。
4. 執行低通濾波可降低銳度(sharpness)

問題 30：下述關於影像處理之雜訊平滑化的敘述，何者有誤？

1. 是一種計算每一個像素(pixel)與其大量邊緣像素(surrounding pixels)之平均值的區域處理(zone-processing method)。
2. 在執行低對比或非常低曝光量影像時，非常有用。
3. 原始影像的銳度愈高，將使用愈大量的像素計算平均值。
4. 其設計為移除高通濾波(high-pass filtering)所無法移除的雜訊。

問題 31：下述何者關於執行影像處理的理由最不適切？

1. 為了強化資料整合
2. 為了強化或柔和某些區域，以取得想要的影像
3. 為了將低曝光量的 X 光影像轉換為高品質影像
4. 可同時使用處理前與處理後的影像

問題 32：將過亮或過暗之影像進行轉換時，常使用何種方法強化整體的對比度？

1. 中值濾波(Median filtering)
2. 算數運算
3. 邊緣偵測(Edge detection)
4. 直方圖等化(Histogram equalization)

問題 33：下述何種技術以二進位尺度為基礎，並透過幾何計算，合併比預先設定之閾值(threshold)為高的像素，進行主題描繪的閾值再現。

1. SSD (shaded surface display)
2. VRT (volume rendering technique)
3. MPR (multi planner reformat)
4. Virtual endoscopy

問題 34：下述何者領域率先應用電腦輔助診斷 CAD (computer-aided diagnosis)？

1. X 光—乳房 X 光攝影
2. 電腦斷層掃描—胸腔
3. 核磁共振造影—腦部
4. 超音波檢查—腹部

問題 35：下述關於量子偵測效率 DQE (detective quantum efficiency)的敘述，何者正確？

1. $DQE = \text{輸入偵測器的訊號雜訊比}^2 / \text{輸出偵測器的訊號雜訊比}^2$
2. 代表偵測光子(photons)或電子(electrons)的效率之能力。
3. $DQE = \text{病患的輻射暴露劑量} / \text{影像品質}$
4. DQE 的各個空間頻率均相等。

問題 36：下述關於交換集線器(switching hubs)的敘述，何者有誤？

- a. 交換集線器比中繼集線器(repeater hubs)對網路的負載較低。
 - b. 交換集線器執行橋接功能。
 - c. 交換集線器無法連接不同速度的網路。
1. 只有 a 2. 只有 b 3. 只有 c 4. 以上皆無誤

問題 37：RAID 是用 6 個 500GB (十億位元組)的硬碟建立。實際可用的儲存容量約為 3 TB (兆位元組)時，RAID 的建立層級為何？

1. RAID 0 2. RAID 1 3. RAID 5 4. RAID 0+1

問題 38：下述何者 RAID 即使在建構 RAID 的其中一個磁碟損毀時，仍可以讀取資料？

- a. RAID 0 b. RAID 1 c. RAID 5
1. a 與 b 2. a 與 c 3. b 與 c 4. 上述皆無此能力

問題 39：下列何者與 RAID 的關聯性最小？

- 1. 切分/延展(Striping)
- 2. 同位元檢查(Parity)
- 3. 熱備援(Hot Spare)
- 4. 位元組重排(Byte Swap)

問題 40：何種 RAID 有低的容錯(low fault-tolerance)，但有最快的資料輸入/輸出速度？

1. RAID 0 2. RAID 1 3. RAID 4 4. RAID 5

問題 41：何種 RAID 有最大的容錯(greatest fault-tolerance)？

1. RAID 3 2. RAID 4 3. RAID 5 4. RAID 6

問題 42：下圖所指為何？



1. 顯示卡(Graphic board) 2. 音效卡(Sound board) 3. RAID 卡 4. 主機板

問題 43：下列何者有最高的鮑率(baud rate)？

- 1. 10BASE
- 2. Gigabit Ethernet (十億位元組乙太網路)
- 3. Fast Ethernet (高速乙太網路)
- 4. Ethernet (乙太網路)

問題 44：下述關於纜線的一般用法，何者有誤？

- a. 直接使用直通纜線(straight cable)連接兩台電腦
 - b. 使用交叉纜線(cross cable)透過每台集線器的標準埠連接兩台集線器
 - c. 使用直通纜線連接電腦與集線器
1. 只有 a 2. 只有 b 3. 只有 c 4. 以上皆無誤

問題 45：下述何者相當於 1GB/s (十億位元/秒)？

1. 2. Gbps 2. 8 Gbps 3. 16 Gbps 4. 32. Gbps

問題 46：1000 BASE-TX 網路，一般使用何種纜線？

1. 種類 6 (Category 6) 2. 種類 5 3. 種類 4 4. 種類 3

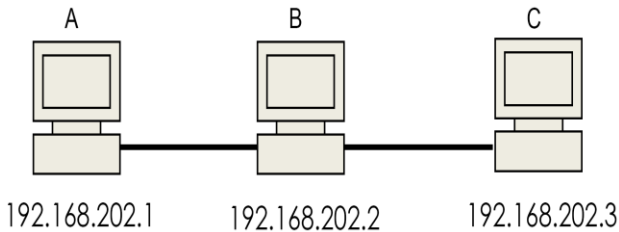
問題 47：下述何者並非光纜(fiber-optic cable)的好處？

- 1.寬的頻寬(Broad band width)
- 2.容忍雜訊
- 3.易於安裝/維護
- 4.高安全性

問題 48：何種指令是用於檢查本身終端的網路設定環境？

1. ipconfig/all
2. ipconfig/mine
3. ipconfig/machine
4. ipconfig/with

問題 49：何種 ping 指令最適合用以確認下圖 A 與 C 間的連結？



1. ping 192.168.202.1-3
2. ping 192.168.202.3-1
3. ping 192.168.202.3
4. ping 192.168.202.123

問題50：何種檢查的組合不適合用以判定圖形伺服器(graphics Server)的容量？

- a.檢查的數量
 - b.連結之影像顯示終端(image displaying terminals)的數量
 - c.儲存時的影像壓縮比
 - d.圖形資料的傳輸速度
1. a 與 b
 2. a 與 c
 3. b 與 d
 4. c 與 d

問題 51：何種伺服器連結結構可用於建立儲存的網路並管理所有儲存控制？

- 1.DAS (direct attached storage)
- 2.SAN (storage area network)
- 3.CAS (content addressed storage)
- 4.NAS (network attached storage)

問題 52：下列關於不斷電電源供應器 UPS (uninterrupted power supply)的敘述，何者正確？

- a. 內建於大部分的設備中。
 - b. 一個 UPS 單元可連接至多個裝置使用。
 - c. 因為隨時均在充電狀態，因此並無電池壽命的問題。
- 1.只有 a
 - 2.只有 b
 - 3.只有 c
 - 4.以上皆誤

問題 53：下列何者不適合放置於影像伺服器的房間內？

- 1.空調
- 2.灑水器
- 3.人員進出登記日誌
- 4.電話

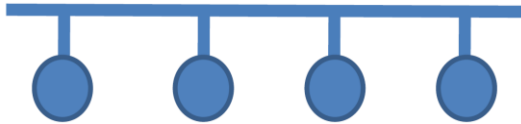
問題 54：下述何者並不適合用以處理自其他機構取得的 CD-R (可錄式光碟)？

- a.在使用該 CD-R 前，在未連接網路的終端機執行病毒檢查
 - b.顯示影像，以確認病患的姓名是否正確
 - c.在傳輸至院內伺服器前，變更病患的識別代碼
- 1.只有 a
 - 2.只有 b
 - 3.只有 c
 - 4.以上皆合適

問題 55：下述何者並非使用 CD 拷貝的好處？

- 1.易於安全保管
- 2.可在單片 CD 上儲存大量影像
- 3.可在每張影像上記錄 DICOM (醫學數位影像及通信標準)檔頭資訊。
- 4.可使用數位轉換器轉換為 DICOM 檔

問題 56：何種網路拓樸(network topology)與下圖顯示的一致？



1. 匯流排區域網路(Bus formed LAN)
2. 星狀區域網路(Star formed LAN)
3. 環狀區域網路(Ring formed LAN)
4. 樹狀區域網路(Tree formed LAN)

問題 57：下述關於視窗寬度 WW/視窗層級 WL(window width/window level)電腦斷層影像呈現的敘述，何者有誤？

1. 視窗寬度與電腦斷層可使用灰階呈現的數量大小有關。
2. 影像的對比度可能因視窗寬度而有所變動。
3. 視窗層級指的是灰階的中位數值。
4. 如果視窗層級較高，將會顯示較少吸收 X 光而附有空氣的影像

問題 58：下述關於 WW/WL(視窗寬度/視窗層級)組合的敘述，何者適用於觀察肝臟的腹部平面電腦斷層影像？

1. WW250 / WL30
2. WW512. / WL20
3. WW1500 / WL600
4. WW800 / WL200

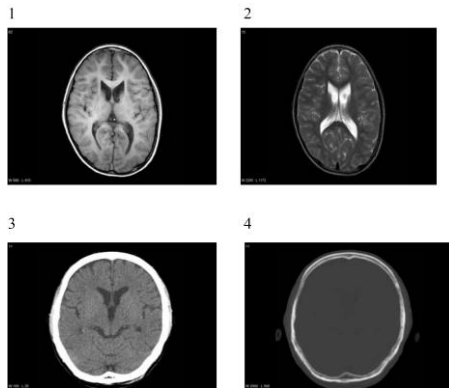
問題 59：下述何者不適合作為操作 PACS (醫療影像擷取與傳輸系統)的遵守原則？

1. 儲存的影像資料必須與儲存於 DB (資料庫)中的影像資訊相呼應。
2. 需採取控制措施(如升級)，以將病毒對伺服器與終端機之潛在傷害降至最低。
3. 當病患離院時，從伺服器影像中刪除該住院病患的影像。
4. 視需要致力改善檢視機(viewer)與 PACS 相關的軟體。

問題 60：下列何者與叢集(cluster)最有關？

1. 伺服器
2. 儲存設備(Storage)
3. 網路設備
4. 閘道器(Gateway)

問題 61：何種影像為 T2 加權影像？



問題 62：下述何者為連接影像與醫囑資訊(order information)的最基本資訊？

1. 病患識別代碼
2. 登錄號
3. 資料庫記錄編號
4. 系統日期與時間

問題 63：何種媒體主要作為短期的儲存裝置？

1. 磁碟陣列
2. DVD (數位視訊光碟)
3. MOD (多媒體隨選視訊)
4. 磁帶

問題 64：下述何種系統屬於直接轉換法(X 光能量→電子訊號)？

1. 增感屏(Screen)/軟片(film)
2. 電腦放射線攝影
3. 間接數位化放射線攝影
4. 直接數位化放射線攝影

問題 65：何種情況不適合準備成像板(IP)？

- 1.線性(linearity)必須良好落於 10^4 mR 的範圍內。
- 2.必須對雷射光束具有超敏性反應。
- 3.可接受從刺激到發光間的長反應時間。
- 4.必須長期保存潛像(latent image)。

問題 66：下列關於使用單一電荷耦合元件(CCD)元素與由螢光板與 CCD 相機所組成之偵測器的敘述，何者有誤？

- 1.由愈多 CCD (電荷耦合元件)組成的結構，可提供愈高的解析度。
- 2.螢光板與 CCD (電荷耦合元件)間可縮短的距離有限，而使難以減低偵測器的厚度。
- 3.因為組成在螢光板上形成之影像的光線會大量流失，將無可避免地需增加輻射劑量。
- 4.光線的流失會導致較低的訊號/雜訊比。

問題 67：一般醫學螢幕極速擴展圖形陣列(UXGA)的解析度為何？

- 1.1280×1024 2.1600×1200 3.2048×1536 4.2560×2048

問題 68：液晶顯示器(LCD)的平均壽命為何？

1. 300 小時 2. 3,000 小時 3.30,000 小時 4.300,000 小時

問題 69：下述何者與液晶顯示器(LCD)無關？

- 1.電極 2. 偏振板(Polarization plate) 3.背光 4.磷光體(Phosphors)

問題 70：述關於 LCD (液晶顯示器)與 CRT (陰極射線管)的敘述，何者正確？

- 1.LCD 比 CRT 表現出更大的幾何變形(geometric distortion)。
- 2.LCD 比 CRT 表現出更大的視角依賴性(viewing-angle dependency)。
- 3.CRT 不需要進行校正。
- 4.LCD 的亮度並不會退化。

問題 71：下述關於 CRT 螢幕的敘述，何者有誤？

- 1.一般而言，CRT 螢幕的對比比率明顯優於 LCD 螢幕。
- 2.相較於 LCD 螢幕，CRT 螢幕較容易受到外來光源的影響。
- 3.察覺到閃爍是肇因於螢光源的干擾。
- 4.相較於 LCD 螢幕，CRT 螢幕較不容易受到磁場的影響。

問題 72：下述關於使用 AAPM TG-18-QC 進行評估時的敘述，何者有誤？

- 1.在進行評估前，先清潔螢幕。
- 2.打開電源後，等候約 30 分鐘。
- 3.透過目視檢查，將光標(patch)設為 5% 或 95% 較為理想。
4. 如果可清楚辨識 16 種不同層級的亮度，將較為理想。

問題 73：下述何者可用於判定最大的亮度與亮度比？



1. A 與 C 2. B 與 D 3. B 與 C 4. A 與 D

問題 74：何種(1)與(2)的組合，適合下列的描述？「亮度的單位是(1)，而照度(illuminance)的單位是(2)。」

- 1.(1) lx (2) cd/m^2
- 2.(1) cd/m^2 (2) lx
- 3.(1) candela (2) cd/m^2
- 4.(1) cd/m^2 (2) candela

問題 75：下述何者並非使用 SMPTE 測試訊號評估螢幕控制的一部份？

- 1.50%平均圖像準位(APL pattern) 2.交叉型態(Cross pass pattern) 3.雜訊 4.灰階

問題 76：下述關於醫學數位影像及通信標準(DICOM)的規格敘述，何者正確？

1. DICOM 的規格分為兩部份：一種為全球共用，另一種由各國家自行訂定。
2. 所有影像傳輸均必須使用 DICOM 規格。
3. 所有符合 DICOM 的儀器均獲得實境測試(Connectathon)的批准。
4. 所有符合 DICOM 的儀器均需隨附一致性聲明。

問題 77：下述何者與醫學數位影像及通信標準(DICOM)一致性聲明的相關性最低？

- 1.膠片 2.DICOM 印表機 3.電腦斷層儀器 4.超音波診斷裝置

問題 78：從影像系統傳送影像至影像伺服器時，影像伺服器需要？

- 1.查詢/讀取 SCU (服務使用類別)
2.查詢/讀取 SCP (服務提供類別)
3.儲存 SCU (服務使用類別)
4.儲存 SCP (服務提供類別)

問題 79：下表呈現之 DICOM 資料結構的適當值長度(***)為何？

組別	元素	值表示	值長度	值欄位
0008	0020	DA	(***)	20070916

1. 2 2. 4 3. 8 4. 12

問題 80：醫學數位影像及通信標準(DICOM)標籤上並未提供何種資訊？

- a.病患姓名 b.出生日期 c.檔案是否已壓縮
1.只有 a 2.只有 b 3.只有 c 4.以上皆非(a~c 均有提供)

問題 81：何種格式為錯誤的醫學數位影像及通信標準(DICOM)標籤？

- 1.(0008,0010) 2.(0010,0010) 3.(7FE0,0010) 4.(7HE0,0010)

問題 82：下述描述所指為何？「在使用醫學數位影像及通信標準(DICOM)進行真實資料傳輸前，以進行驗證為目的傳送一段訊息」

- 1.關聯(Association) 2.協調(Coordination) 3.通訊(Communication) 4.登入(Log in)

問題 83：下列何者與醫學數位影像及通信標準(DICOM)壓縮的關聯性最高？

- 1.目錄(DICOM DIR)
2.聯合圖像專業團體(DICOM JPEG)
3.可燒錄式光碟(DICOM CDR)
4.服務使用類別(DICOM SCU)

問題 84：何種通訊協定適用於建立醫學數位影像及通信標準(DICOM)的網路基礎？

- 1.國際行動通訊(2000IMT-2000)
2.傳輸控制協定/網際網路通訊協定(TCP/IP)
3.分碼多重擷取系統(CDMA)
4.乙太網路(Ethernet)

問題 85: 下述為包含於 DICOM 檔頭資訊內的研讀實體唯一識別碼(UID)範例。何種範例並不適當？

<範例> 0020,000D 研讀實體唯一識別碼

1.2.410.200001.82.106.E7093567

- 1.(圓點 dot) 2. 0 (數字) 3. 1 (數字) 4. E (字母)

問題 86: 下述關於輸入 PACS 之 DICOM 資料的敘述，何者並不恰當？

- 1.輸入 PACS 的資料可區分為 DICOM 影像與資料庫資訊。
- 2.資料庫資訊的容量比 DICOM 影像的容量大許多。
- 3.資料庫資訊包含 DICOM 影像、病患資訊、檢查資訊、其他資訊型態的指標值。
- 4.大部分的影像資訊均以檔案格式儲存。

問題 87: 使用何種裝置將非 DICOM 一致性裝置連接至 PACS？

- 1.HL7 2.擷取伺服器(Acquisition Server) 3.儲存裝置(Storage) 4. DICOM 閘道器

問題 88: 下列何者與連結病患資訊與 X 光單位，以確保資訊之準確性的功能最有關？

- 1.DICOM 閘道器(DICOM gateway)
- 2.影像機器工作清單
3. 膠片數位轉換器(Film digitizer)
- 4.備份裝置

問題 89: 下述關於 IHE (醫療資訊整合)的敘述，何者有誤？

- 1.使用標準規格的工作流程
- 2.可用於建立多重主機系統
- 3.受限於僅能在放射線部門內操作
- 4.1999 年在美國提出

問題 90: 下列何種美國法律，建立個人資訊之管理與安全性的相關條文？

1. DICOM 2. HIPPA 3. IHE 4. HL7

1. As for PACS (Picture Archiving Communication System), which of the following network and transfer mode has the highest transfer speed now?
(A) Ethernet (B) 100 Mega Ethernet (C) ADSL (D) ATM **D**

2. In DICOM, which of the following is not a service class?
(A) image storage (B) image query (C) image modality (D) image retrieval **C**
(*Digital Imaging and Communications in Medicine DICOM*)

3. Which of the following is a protocol at the bottom of network transfer for DICOM?
(A) TCP / IP (B) WCDMA (C) UDP (D) GPRS **C**

4. Which of the following statements about digital computer is incorrect?
(A) A byte is a binary number composing the digit “1” or “0”. (B) ROM is short for Read Only Memory. (C) RAM is short for Random Access Memory. (D) A file is a unit composed of mutually correlated records. **A**

5. What is the advantage of recording images under the DICOM mode?
(A) saving storage space (B) increasing transfer speed (C) enabling different instruments and brands to be presented at different workstations (D) enhancing the diagnosis efficiency **C**

6. How many bits are generally used in digital radiography?
(A) 16 (B) 12 (C) 8 (D) 2 **B**

7. Given a digital image using 10 bits to record the gray scale of every pixel, what is the difference between the maximum gray scale and the minimum gray scale of the digital image?
(A) 1024 (B) 512 (C) 256 (D) 4096 **A**

8. What is the minimum capacity of a hard disk drive capable of storing 900 1024×1024 16-bit gray scales?
(A) 200 MB (B) 200MB (C) 2 GB (D) 20 GB **C**

9. How does a digital image look when its high frequency component is enhanced?
(A) clearer (B) more blurred (C) less prone to interference from noise (D) more capable of eliminating periodic noise **A**

10. Which of the following image formats is used in image storage and transfer in PACS (Picture Archiving and Communication Systems)?
(A) TIFF (B) BMP (C) JPEG (D) DICOM **D**

11. Which of the following network connections is not applicable to a local area network (LAN) that uses PACS?
 (A) DS-1 (digital service level 1), 1.544 Mbits/sec ㉑
 (B) DS-3 (digital service level 3), 45 Mbits/sec
 (C) ATM, 155-622 Mbits/sec ㉒
 (D) USB 2.0, 700 Mbits/sec **D**
12. What is the gray scale for an image commonly known to have 9 bits per pixel?
 (A) 0~255 ㉑ (B) 0~511 ㉒ (C) 0~1023 (D) 0~2045 **B**
13. Which of the following may produce a medical image with of 4k×4k×12 bits / pixel?
 (A) CT (B) CR (computed radiography) (C) MR (D) DM (digital mammography) **D**
14. Which of the following protocols is used on the images and texts from Website to web browser after a homepage is built for PACS?
 (A) DICOM 3.0 (B) HL7 (C) HTTP (D) JPEG **C**
15. Which of the following statements about the basic functions of a display workstation in PACS is incorrect?
 (A) Fourier transform calculation (B) window and level (C) histogram modification
 (D) zoom and scroll **A**
16. Which of the following is not an input component of a computer?
 (A) Keyboard (B) Trackball (C) Touch screen (D) Array processor **D**
17. What kind of Printer Service Class is DICOM laser printer ? **A**
 (A) SCP (B) SCU (C) SCP+SCU (D) none
18. Which is the organization developed DIMCOM?
 (A)WHO (B) ACR (C)RSNA (D) NEMA **D**
19. In the DR system, a flat panel detector has dimensions of 14×17 inches and is characterized by 2560×3072 detector element matrix. Theoretically speaking, what is the highest resultant digital image resolution (Nyquist frequency in lp/mm)? **B**
 (A) 7.2 (B) 3.6 (C) 1.8 (D) 0.9
20. Which one is not the storage media for PACS?
 (A) RAID (redundant array of inexpensive disks) (B) digital optical cartridge tape
 (C) film (D) DVD-ROM **C**

21. Which of the following is a component of the direct digital radiography detectors ?
(A) CsI (B) CCD (C) Amorphous Silicon (D) Amorphous Selenium **D**
22. What's the necessity of Imaging workstations (display workstation)?
(A) DICOM Query/Retrieve SCP (B) DICOM Query/Retrieve SCU
(C) DICOM Print SCP (D) Above all **B**
23. Which of the following is the characteristic of Clustering?
(A) IP Address and the name of the computer sharing
(B) Disk Array sharing
(C) Application software sharing
(D) Above all **D**
24. Which is the safest and most economic way for image data saving ?
(A) Raid 0 (B) Raid 1 (C) Raid 2 (D) Raid 5 **D**
25. Which of the following is the storage devices applied to optic fiber?
(A) DAS (Direct Attached Storage)
(B) NAS (Network Attached Storage)
(C) SAN (Storage Area Network)
(D) LTO (Linear Tape-Open) **C**
26. What is the most appropriate monitor for displaying CR and DR images?
(A) 1MP (B) 2MP (C) 3MP (D) 5MP **D**
27. How many bits Network IP address System is IPV6(Internet Protocol Version 6)?
(A) 32bits (B) 64bits (C) 128bits (D) 256bits **C**
28. Which of the following is DICOM standard compression format?
(A) JPEG (B) JPEG200 (C) JPEG2000 (D) JPEG2007 **C**
29. In which layer of the OSI (Open Systems Interconnection) reference model is the HL7 (Health Level 7) emphasize on?
(A) Data Link (B) Application (C) Network (D) Presentation **B**
30. HIPAA stands for?
(A) Health Information Protection and Accountability Act
(B) Healthcare Information Privacy and Authorization Act
(C) Health Information Portability and Accountability Act
(D) Health Information Portability and Autonomy Act **C**

- 1.下列何者是屬於直接式數位 X 光攝影機之偵檢器之元件?.....易
A. CsI B. CCD C. Amorphous Silicon D. Amorphous Selenium
- 2.影像工作站(Display workstation)需要有.....中
A. DICOM Query/Reyrieve SCP B. DICOM Query/Reyrieve SCU
C. DICOM Print SC P D. Above all
- 3.下列何者是 Clustering 的特性?.....中
A. IP Address 和電腦名稱共有 B. Disk Array 共有
C. 應用軟體共有 D. 以上皆是
- 4.下列何者對資料保存有較佳安全性與經濟性?.....中
A. Raid 0 B. Raid 1 C. Raid 2 D. Raid 5
- 5.光纖是應用於下列何種儲存裝置?.....中
A. DAS (Direct Attached Storage)
B. NAS (Network Attached Storage)
C.SAN (Storage Area Network)
D. LTO (Linear Tape-Open)
- 6.CR 與 DR 影像最適用何種顯示螢幕?.....易
A. 1MP B.2MP C.3MP D.5MP
- 7.IPV6(Internet Protocol Version 6)是多少 bit Network IP address System?
A. 32bits B.64bits C.128bits D.256bits.....中
- 8.下列何種壓縮格式是 DICOM 標準壓縮格式?.....易
A. PEG B.JPEG200 C.JPEG2000 D.JPEG2007
- 9.HL7 (Health Level 7) **醫療資訊標準著重於OSI(Open Systems Interconnection) reference model 的哪一層為主?**.....中
A. Data Link B. Application C. Network D. Presentation
10. HIPAA 意為何?難
(A) Health Information Protection and Accountability Act
(B) Healthcare Information Privacy and Authorization Act
(C) Health Information Portability and Accountability Act
(D) Health Information Portability and Autonomy Act

答案:

1.D 2.B 3.D 4.D 5.C 6.D 7.C 8.C 9.B 10.C

1. Which of the following is a component of the direct digital radiography detectors ?
 A. CsI B. CCD C. Amorphous Silicon D. Amorphous Selenium
2. Imaging workstations (Display workstation) need to have
 A. DICOM Query/Retrieve SCP B. DICOM Query/Retrieve SCU
 C. DICOM Print SCP D. Above all
3. Which of the following characteristics is Clustering?
 A. IP Address and the name of the computer sharing
 B. Disk Array sharing C. Application software sharing D. Above all
4. Which of the following disk array for image data saving to better preserve and economic?
 A. Raid 0 B. Raid 1 C. Raid 2 D. Raid 5
5. Which of the following storage devices use optic fiber
 A. DAS (Direct Attached Storage)
 B. NAS (Network Attached Storage)
 C. SAN (Storage Area Network)
 D. LTO (Linear Tape-Open)
6. What kind monitor is the most appropriate use for display CR or DR images
 A. 1MP B. 2MP C. 3MP D. 5MP
7. IPV6(Internet Protocol Version 6)is how many bits Network IP address System?
 A. 32bits B. 64bits C. 128bits D. 256bits
8. Which of the following compression format is the DICOM standard compression format ?
 A. JPEG B. JPEG200 C. JPEG2000 D. JPEG2007
9. HL7 (Health Level 7) standards on medical information in the OSI (Open Systems Interconnection) reference model in which layer of the main
 A. Data Link B. Application C. Network D. Presentation
10. HIPAA stands for
 (A) Health Information Protection and Accountability Act
 (B) Healthcare Information Privacy and Authorization Act
 (C) Health Information Portability and Accountability Act
 (D) Health Information Portability and Autonomy Act

- Q1. What is the correct hexadecimal representation of the binary numeral “1111”?
- (1). E (2). F (3). 11 (4). 1A
- Q2. What is the smallest unit of information, represented by 0 and 1, that can be handled by computers?
- (1). byte (2). nibble (3). bit (4). KB
- Q3. Which data component input/output processing unit is expressed with a prefix of SI?
- (1). byte (2). field (3). record (4). file
- Q4. What is the number of bits required to express a number from 1 to 12?
- (1). bit (2). 2 bits (3). 3 bits (4). 4 bits
- Q5. Exactly how many bytes make up a gigabytes?
- (1). 1024 (2). 1024×1024
(3). $1024 \times 1024 \times 1024$ (4). $1024 \times 1024 \times 1024 \times 1024$
- Q6. Which character encoding scheme has a code length of 1 byte?
- (1). ASCII (2). EUC (3). Unicode (4). TRON
- Q7. Which network term is used to refer to a computer or software that receives service from another network device in a decentralized data processing system?
- (1). Client (2). Server
(3). DTE (Data Terminal Equipment) (4). Gateway
- Q8. Which system is a UNIX-like operating system (OS) with a published program source code?
- (1). Windows (2). DOS (3). Linux (4). OS/2
- Q9. Which one of the followings is not classified as an operating system (OS)?
- (1). DOS (2). Windows (3). UNIX (4). Active X
- Q10. Which interface allows connection to a site labeled RJ-45?
- (1). Serial port (2). Analogue monitor
(3). USB (4). LAN cable
- Q11. Which of the followings is a parallel interface?
- (1). USB (2). SCSI (3). IEEE1394 (4). RS-232C

Q12. Which statement concerning RAM and ROM is clearly erroneous?

- (1). RAM allows programs and data to be written anywhere.
- (2). ROM allows the readout but not the deletion of written data.
- (3). ROM and RAM are nonvolatile storage devices.
- (4). A primary storage typically consists of ROM and RAM.

Q13. Which of the followings will loss the information recorded on it once the power is turned off?

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

Q14. Which storage medium uses laser to read and write data?

- (1). ZIP disk
- (2). Optical disk
- (3). Flash memory
- (4). Smart-media card

Q15. Which of the followings is a rewritable storage medium?

- (1). DVD-ROM
- (2). DVD-R
- (3). DVD+R
- (4). DVD-RAM

Q16. Which of the followings is not an optical medium?

- (1). Zip
- (2). MO
- (3). CD-R
- (4). DVD-ROM

Q17. Which of the followings is a virtual private network that uses the Internet?

- (1). WAN
- (2). VPN
- (3). ASP
- (4). ISP

Q18. What is the resolution of a 640×400 digital image displayed in the size of 10 inch \times 8 inch?

- (1). 64 mm \times 50 mm
- (2). 64 ppi \times 50 ppi
- (3). 64 lx \times 50 lx
- (4). 64 Hz \times 50 Hz

Q19. Which statement correctly describes the term “7,200 rpm” concerning a hard disk?

- (1). The number of disk revolutions is 7,200 per minute.
- (2). The mean access time is 7,200 ms.
- (3). Data is written at a maximum speed of 7.2 GB per minute.
- (4). It is a hard disk having 7,200 sectors.

Q20. What does the following statement best describe?

“Enable easy search and extraction of saved data”

- (1). Database
- (2). Storage device
- (3). Server device
- (4). LTO

Q21. Which of the followings is not an output device used with PC or PACS?

- (1). Laser Printer
- (2). Speaker
- (3). CRT Monitor
- (4). Digitizer

Q22. Which operating process converts spatially and temporally continuous values into an assembly of discrete points?

- (1). Sampling
- (2). Quantization
- (3). DA conversion
- (4). DICOM conversion

Q23. What level of quantization is generally used in medical imaging?

- (1). 4~10 bits
- (2). 6~10 bits
- (3). 8~16 bits
- (4). 10~24 bits

Q24. Which statement about graphical data compression is correct?

- (1). Huffman encoding is one of the lossless compression methods.
- (2). Lossless compressions result in a smaller volume of graphics data than lossy compressions.
- (3). An image after compression has an increased resolution than the original image.
- (4). A lossless compression performed using the JPEG format reduces the data volume to about 1/300.

Q25. In the latest version of JPEG, which compression method is based on Wavelet?

- (1). MPEG
- (2). JPEG 2000
- (3). Motion JPEG
- (4). JPG

Q26. Which statement about JPEG2000 is incorrect?

- (1). It is capable of a greater degree of image compression at a better quality than JPEG.
- (2). It is a compression method that performs quantization and encoding by discrete cosine transform.
- (3). It allows a single graphics data to be turned into images at different resolutions.
- (4). JPEG2000 is also capable of lossless compressions.

Q27. Which format is not a graphical data compression format?

- (1). TIFF
- (2). MP3
- (3). GIF
- (4). JPEG

Q28. Which of the followings has the least to do with lossy compressions?

- (1). DCT (discrete cosine transform)
- (2). The principle of band equalizer for audio devices
- (3). The pursuit of perfect decompressions of graphics data
- (4). The alignment of data in the order of importance for data transfer

Q29. Which statement about low-pass filtering is incorrect?

- (1). Performing low-pass filtering eliminates high-frequency components.
- (2). Performing low-pass filtering has a smoothing effect.
- (3). Performing low-pass filtering eliminates low-frequency components.
- (4). Performing low-pass filtering decreases sharpness.

Q30. Which statement concerning noise smoothing in image processing is incorrect?

- (1). It is a zone-processing method that takes the mean value of each pixel and a large number of surrounding pixels.
- (2). It is effective when performed on low contrast or very low exposure images.
- (3). The more it is performed using the mean values of a large number of pixels the sharper the original image will become.
- (4). It is designed to remove noises not removed by high-pass filtering.

Q31. Which statement concerning the reason for performing image processing is the most inappropriate?

- (1). To enhance data integrity
- (2). To accentuate or tone down certain regions so as to achieve a desired image
- (3). To convert an underexposed X-ray image to a high-quality image
- (4). Availability of both pretreatment and after-treatment

Q32. Which processing method is often used to enhance the overall contrast when converting an overly bright or an overly dark image?

- | | |
|-----------------------|-----------------------------|
| (1). Median filtering | (2). Arithmetic operation |
| (3). Edge detection | (4). Histogram equalization |

Q33. Which of the followings is a binary-scale-based technique, also known as threshold rendering that portrays the surface of a subject by combining pixels with intensity greater than a preset threshold through geometric computations?

- | | |
|-----------------------------------|---------------------------------------|
| (1). SSD (shaded surface display) | (2). VRT (volume rendering technique) |
| (3). MPR (multi planner reformat) | (4). Virtual endoscopy |

Q34. In which field was the application of CAD (computer-aided diagnosis) first attempted?

- | | |
|------------------------|---------------------|
| (1). X-ray – mammogram | (2). CT – chest |
| (3). MRI - brain | (4). SONO – abdomen |

- Q35. Which statement concerning DQE (detective quantum efficiency) is correct?
- (1). $DQE = \text{input detector's SNR}^2 / \text{output detector's SNR}^2$
 - (2). It represents the capability of how efficiently photons or electrons can be detected.
 - (3). $DQE = \text{dose of radiation exposure to patient} / \text{image quality}$
 - (4). The DQE at each spatial frequency is equivalent.
- Q36. Which statement about switching hubs is incorrect?
- a. Switching hubs place a lighter load on a network than repeater hubs.
 - b. Switching hubs perform the bridge-function.
 - c. Switching hubs cannot be use to connect networks having different speeds.
- (1). only a
 - (2). only b
 - (3). only c
 - (4). None of a to c are incorrect
- Q37. A RAID was set up using six 500-GB hard disks. When the actual usable storage capacity is approximately 3 TB, what is the RAID level of this setup?
- (1). RAID 0
 - (2). RAID 1
 - (3). RAID 5
 - (4). RAID 0+1
- Q38. Which RAID would still enable data reading even after one of the disks that constitute the RAID is broken?
- a. RAID 0
 - b. RAID 1
 - c. RAID 5
- (1). a and b
 - (2). a and c
 - (3). b and c
 - (4). None of a to c has the capability
- Q39. Which of the followings has the least to do with RAID?
- (1). Striping
 - (2). Parity
 - (3). Hot Spare
 - (4). Byte Swap
- Q40. Which RAID has a low fault-tolerance but the fastest data input/output speed?
- (1). RAID 0
 - (2). RAID 1
 - (3). RAID 4
 - (4). RAID 5
- Q41. Which RAID has the greatest fault-tolerance?
- (1). RAID 3
 - (2). RAID 4
 - (3). RAID 5
 - (4). RAID 6
- Q42. What is depicted in the figure below?
- (1). Graphic board
 - (2). Sound board
 - (3). RAID board
 - (4). Motherboard

Q43. Which of the following has the highest baud rate?

- (1). 10BASE
- (2). Gigabit Ethernet
- (3). Fast Ethernet
- (4). Ethernet

Q44. Which general usage of a cable is incorrect?

- a. Connecting two computers directly with a straight cable
- b. Connecting two hubs through the regular port on each hub with a cross cable
- c. Connecting a computer to a hub with a straight cable

- (1). only a
- (2). only b
- (3). only c
- (4). None of a to c are incorrect

Q45. Which one of the followings corresponds to 1GB/s?

- (1). 2 Gbps
- (2). 8 Gbps
- (3). 16 Gbps
- (4). 32 Gbps

Q46. Which cable is typically used for a 1000 BASE-TX network?

- (1). Category 6
- (2). Category 5
- (3). Category 4
- (4). Category 3

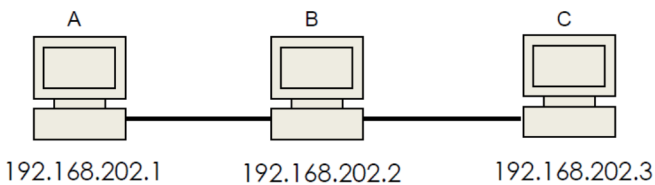
Q47. Which one of the followings is not a benefit of fiber-optic cables?

- (1). Broad band width
- (2). Tolerates noises
- (3). Easy installation/maintenance
- (4). High level of security

Q48. Which command is used to check the network configuration environment of one's own terminal?

- (1). ipconfig/all
- (2). ipconfig/mine
- (3). ipconfig/machine
- (4). ipconfig/with

Q49. Which ping command is the most appropriate for verifying the connection between A and C in the figure below?



- (1). ping 192.168.202.1-3
- (2). ping 192.168.202.3-1
- (3). ping 192.168.202.3
- (4). ping 192.168.202.123

Q55. Which one of the following is not an advantage of a CD copy?

- (1). Easy safekeeping
- (2). A capacity to store a large number of images on a single CD
- (3). Able to record the DICOM header information along with each image.
- (4). Can be converted to a DICOM file using a digitizer

Q56. Which network topology corresponds to the one shown in the figure below?



- (1). Bus formed LAN
- (2). Star formed LAN
- (3). Ring formed LAN
- (4). Tree formed LAN

Q57. Which statement about WW/WL (window width/window level) CT image displays is incorrect?

- (1). Window width is related to the range of CT numbers that can be displayed on the gray scale.
- (2). The contrast of an image may vary depending on the window width.
- (3). The term window level refers to the gray-scale median value.
- (4). If the window level is great, a display closer to one with air that has little X-ray absorption will be displayed

Q58. Which combination of WW/WL (window width/window level) is appropriate for abdominal plain CT images intended for liver observation?

- (1). WW250 / WL30
- (2). WW512 / WL20
- (3). WW1500 / WL-600
- (4). WW800 / WL200

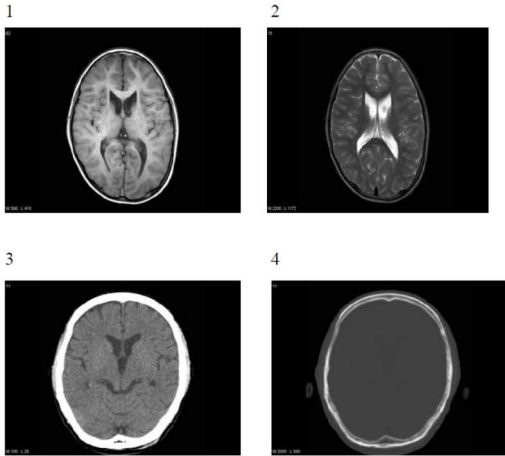
Q59. Which of the following is the most inappropriate with respect to compliance rules for operating a PACS?

- (1). The stored image data must correspond to the image information stored in the DB.
- (2). Taking control measures such as upgrading is needed to minimize any potential damages from viruses to the server and terminals.
- (3). Delete from the server images belonging to a hospitalized patient when he or she is being discharged from the hospital.
- (4). Make efforts to improve the viewer-and the PACS-related software when necessary.

Q60. Which one of the followings has the most to do with cluster?

- (1). Server
- (2). Storage
- (3). Network
- (4). Gateway

Q61. Which image is a T2-weighted image?



Q62. Which one of the followings is the most basic information for linking an image to the order information?

- (1). Patient ID
- (2). Accession No.
- (3). Data base record No.
- (4). System date and time

Q63. Which medium is used predominantly by short-term storage devices?

- (1). Disk array
- (2). DVD
- (3). MOD
- (4). Tape

Q64. Which system corresponds to a direct conversion method (X-ray energy → electronic signals)?

- (1). Screen/film
- (2). Computed radiography
- (3). Indirect digital radiography
- (4). Direct digital radiography

Q65. Which condition is inappropriate for preparing IP (imaging plates)?

- (1). The linearity must be good within the range of 104 mR.
- (2). Supersensitive reactions to a laser beam is a requisite.
- (3). A long reaction time from stimulation to light-emission is acceptable.
- (4). The long-term preservation of a latent image is a requisite.

Q66. Which is an incorrect statement about the method of using a single CCD element with a detector made up of a combination of a fluorescent plate and a CCD camera?

- (1). A configuration made up of a larger number of CCD offers a higher resolution.
- (2). There is a limit as to how much the distance between the fluorescent plate and CCD can be shortened, making it difficult to reduce the thickness of the detector.
- (3). Due to the extensive loss of light that constitutes the image formed on the fluorescent plate, an increased dose of radiation cannot be avoided.
- (4). The loss of light results in a lower S/N ratio.

Q67. What is the resolution of a general medical monitor UXGA?

- (1). 1280×1024
- (2). 1600×1200
- (3). 2048×1536
- (4). 2560×2048

Q68. What is the average life of a LCD (liquid crystal display)?

- (1). 300 hours
- (2). 3,000 hours
- (3). 30,000 hours
- (4). 300,000 hours

Q69. Which one of the followings is unrelated to a LCD (liquid crystal display)?

- (1). Electrode
- (2). Polarization plate
- (3). Backlight
- (4). Phosphors

Q70. Which statement about a LCD (liquid crystal display) and a CRT (cathode ray tube) is correct?

- (1). LCD exhibit a greater geometric distortion than CRT.
- (2). LCD exhibit a greater viewing-angle dependency than CRT.
- (3). CRT require no calibration.
- (4). The luminance of a LCD does not deteriorate.

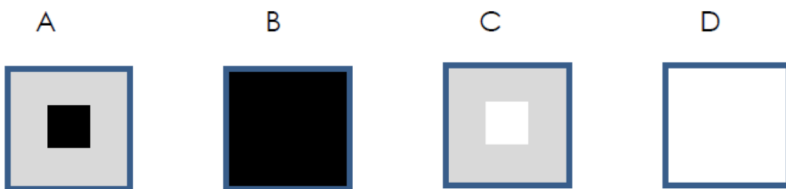
Q71. Which of the following statements about CRT monitors is incorrect?

- (1). Generally, the contrast ratio of CRT monitors is greatly superior to that of LCD monitors.
- (2). Compared with LCD monitors, CRT monitors are more susceptible to the effect of a foreign light source.
- (3). The perception of flicker generally is caused by the interference from a fluorescent light source.
- (4). Compared with LCD monitors, CRT monitors are less susceptible to the effect of a magnetic field.

Q72. Which statement is incorrect when using an AAPM TG-18-QC pattern to perform an assessment?

- (1). Clean the monitor surface before an assessment.
- (2). Wait for about 30 minutes after turning on the power.
- (3). Achieving a visual verification of either the 5% patch or the 95% patch would be fine.
- (4). It would be fine if the 16 levels of luminance could clearly be differentiated from one another.

Q73. Which of the following are used to determine the maximum luminance and the luminance ratio?



- (1). A and C
- (2). B and D
- (3). B and C
- (4). A and D

Q74. Which combination of (1) and (2) correctly fits in the statement below?

“The unit for luminance is (1) , and the unit for illuminance is (2).”

- (1). (1) lx (2) cd/m²
- (2). (1) cd/m² (2) lx
- (3). (1) candela (2) cd/m²
- (4). (1) cd/m² (2) candela

Q75. Which is not a part of the assessment for monitor control using an SMPTE test pattern?

- (1). 50% APL pattern
- (2). Cross pass pattern
- (3). Noise
- (4). Gray scale

Q76. Which statement concerning the DICOM specification is correct?

- (1). The DICOM specification is divided into two parts: one shared universally and the other written by each country independently.
- (2). All image transfers must adopt the DICOM specification.
- (3). All DICOM conforming instruments are Connectathon approved.
- (4). All DICOM conforming instruments comes with a conformance statement.

Q77. Which has the least to do with a DICOM conformance statement?

- (1). Film
- (2). DICOM Printer
- (3). CT instrument
- (4). Ultrasound diagnostic device

Q78. What does an image server require when transmitting images from a modality to an image server?

- (1). Query/Retrieve SCU
- (2). Query/Retrieve SCP
- (3). Storage SCU
- (4). Storage SCP

Q79. Which value is an appropriate value length (* * *) for a DICOM data structure presented in the table below?

Group	Element	Value Representation	Value Length	Value Filed
0008	0020	DA	(* * *)	20070916

- (1). 2
- (2). 4
- (3). 8
- (4). 12

Q80. Which piece of information is not provided on a DICOM tag?

- a. Patient name
 - b. Date of birth
 - c. Whether the file is compressed
- (1). only a
 - (2). only b
 - (3). only c
 - (4). None of the above (a~c are all provided)

Q81. Which format is incorrect for DICOM tags?

- (1). (0008,0010)
- (2). (0010,0010)
- (3). (7FE0,0010)
- (4). (7HE0,0010)

Q82. What is the following statement referring to?

“A communication sent for the purpose of verification prior to the actual data transmission by DICOM”

- (1). Association
- (2). Coordination
- (3). Communication
- (4). Log in

Q83. Which of the followings has the most to do with DICOM compressions?

- (1). DICOM DIR
- (2). DICOM JPEG
- (3). DICOM CDR
- (4). DICOM SCU

Q84. Which communication protocol is used to build the foundation of the DICOM network?

- (1). IMT-2000 (international mobile telecommunication-2000)
- (2). TCP/IP (Transmission Control Protocol / Internet Protocol)
- (3). CDMA (code division multiple access)
- (4). Ethernet

Q85. The following are examples of Study Instance UID included in the DICOM header information. Which example is shown in an inappropriate manner?

<Example > 0020,000D Study Instance UID

1.2.410.200001.82.106.E7093567

- (1). . (dot)
- (2). 0 (number)
- (3). 1 (number)
- (4). E (alphabetic letter)

Q86. Which statement concerning DICOM data to be imputed into a PACS is inappropriate?

- (1). Data to be inputted into a PACS can be divided into a DICOM image and database information.
- (2). Database information takes up far more capacity than a DICOM image.
- (3). Database information includes the index value of a DICOM image, patient information, examination information, among other types of information.
- (4). The majority of the image information is saved as files.

Q87. Which is used to connect a non-DICOM-conforming device to a PACS?

- (1). HL7
- (2). Acquisition Server
- (3). Storage
- (4). DICOM Gateway

Q88. Which has the most to do with the function of linking patient information to a X-ray units so as to ensure the accuracy of information?

- (1). DICOM gateway
- (2). Modality worklist
- (3). Film digitizer
- (4). Backup

- Q89. Which statement about IHE is incorrect?
- (1). A workflow using the standard specification
 - (2). Can be used to build a multi-vendor system
 - (3). Limited to operations within the radiology department
 - (4). Was proposed in the U.S. in 1999
- Q90. Which one of the following is a U.S. law that established the regulations concerning the management and security of personal information?
- (1). DICOM
 - (2). HIPPA
 - (3). IHE
 - (4). HL7
- Q91. Which of the following is not a condition of Electronic Medical Record (EMR)?
- (1). Data capture function
 - (2). Data storage function
 - (3). Security function
 - (4). All of the above
- Q92. Which of the following is not True about the function of Transport layer?
- (1). Open and close of network session
 - (2). Control of data flowing
 - (3). Detection of data, which are overlap, loss, order error, and so on
 - (4). Logic channel set up
- Q93. Which of the following describes a procedure of series or a gathering of standard which is promised each other what, how, and when to communicate between two entities that want to do?
- (1). Interface
 - (2). Protocol
 - (3). Procedure
 - (4). Timing
- Q94. When we connect the high speed telecommunication network, which method is used in 3 dimensions or cube structure?
- (1). Star Topology
 - (2). Hyper Cube Topology
 - (3). Ring Topology
 - (4). All of the above
- Q95. Which program translate origin program?
- (1). Compiler
 - (2). Coding
 - (3). Instruction
 - (4). COBOL
- Q96. What is a fragmentation?
- (1). Disc which has many damaged sectors.
 - (2). Disc which has many wasted sectors, when file is read.
 - (3). Disc which has many divided sectors.
 - (4). Disc which is assigned space.

Q97. Which of the following is the time required from an order to read or store in the storage to actually read or store the information

- (1). Idle time
- (2). Run time
- (3). Access time
- (4). Seek time

Q98. What does 1010 in the binary scale change in the denary scale?

- (1). 8
- (2). 10
- (3). 12
- (4). 14

Q99. Which of the following cannot be linked to Modality work list?

- (1). Examination Information
- (2). Reading Information
- (3). Patient Information
- (4). Description Information

Q100. Which of the following can be inserted in the bracket about explanation for the theory which is used in Digital Radiography of indirect method?

Example: X-ray energy → () → Electrical signal

- (1). Indirect Energy
- (2). Direct Energy
- (3). Scattered Energy
- (4). Photo Energy

Q101. What makes uniform frequency of visual density changing density distribution after widely distribution of strength of origin data at all part of the system?

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

Q102. Which of the following is not image data?

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

Q103. Which of the following is not criterion to be checked when select server?

- (1). CPU
- (2). Memory
- (3). DISK
- (4). HUB

Q104. Which of the following is a method to use for purpose of load distribution and prevention of disorder by parallel processing which are connected two computers as one operation system?

- (1). Solution
- (2). Clustering
- (3). Package
- (4). Processing

Q105. Which of the following is a server to search DICOM images anywhere internet can be accessed?

- (1). DB Server
- (2). Web Server
- (3). UNIX Server
- (4). NT Server

Q106. Which of the following is a network to provide data, voice, and images in the wide area like big cities and usually bundled up network?

- (1). LAN (Local Area Network)
- (2). WAN (Wide Area Network)
- (3). MAN (Metropolitan Area Network)
- (4). VAN (Value Added Network)

Q107. Which of the following is not advantages of VAN (Virtual Area Network)?

- (1). Saving communication cost
- (2). Communication for security
- (3). Convenient to expand SOHO environment
- (4). Performing only the management about main frame in the central.

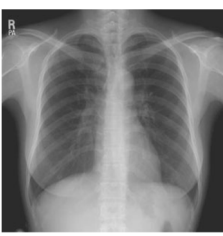
Q108. Which of the following is correct about the class order of OSI 7 layer?

- (1). Physical → Data Link → Transport → Network → Presentation → Session → Application
- (2). Physical → Data Link → Network → Session → Transport → Presentation → Application
- (3). Physical → Data Link → Network → Transport → Session → Presentation → Application
- (4). Physical → Data Link → Network → Transport → Presentation → Session → Application

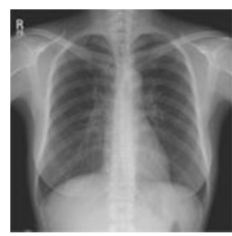
Q109. Which of the following is the correct address to recognize the system at the TCP/IP communication?

- (1). Http
- (2). Ftp
- (3). IP Address
- (4). Gopher

Q110. Which of the following is most likely TRUE?



(256 X 256)



(128 X 128)



(64 X 64)



(32 X 32)

- (1). The change of scanning
- (2). The change of sampling
- (3). The change of quantization
- (4). All of the above

Q111. Which of the following is not included in monitor checking by SMPTE Test Pattern?

- (1). 50% APL pattern
- (2). Noise
- (3). Gray Scale
- (4). All of the above

Q112. Which of the following is correct about the Aliasing Artifact?

- a. It increases the image noise
- b. It causes errors of MTF measurement.
- c. It is made by high frequency of image signal.
- d. It is made by little quantization bit number in the digitalization.

- (1).a, c
- (2).a, b, c
- (3).a, b, c
- (4).b, c, d

Q113. Which of the following is used for quantity test of noise?

- a. TG18-UNL80
- b. SNR (signal to noise ratio)
- c. Line pair test
- d. NPS (noise power spectrum)

- (1). a, c
- (2). a, b, c
- (3). a, b, d
- (4). b, d

Q114. Which of the following is not correct in terms of terminal meaning about PACS (Picture Archiving and Communication System)?

- (1). Picture – All medical images produced in the various modalities
- (2). Arching – Acquisition and storing of medical image by the HL7
- (3). Communication – Sending and receiving medical images
- (4). System – It connects modalities to network and manages medical images efficiently.

Q115. Which of the following is not the daily check point of PACS?

- (1). Verify
- (2). Long term data fetch
- (3). PACS data left out
- (4). Exam statistics

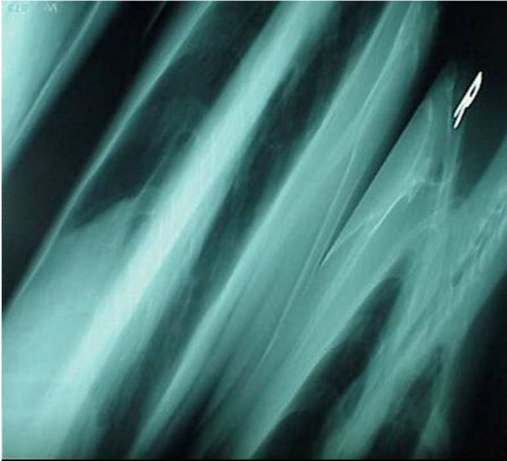
Q116. What is it called to converse compressed image stored off-line to on-line state according to the protocol schedule?

- (1). Verify
- (2). Fetch
- (3). Query
- (4). Send

Q117. Which of the following is the communication protocol based on DICOM Networking?

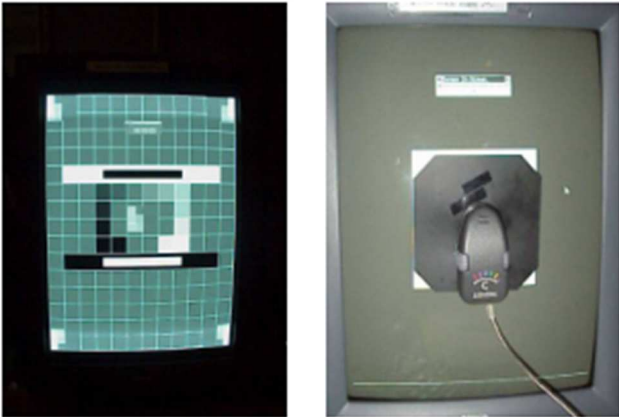
- (1). IMT-2000 (international mobile telecommunication-2000)
- (2). TCP/IP (Transmission Control Protocol / Internet Protocol)
- (3). CDMA (code division multiple access)
- (4). Ethernet

Q118. Which of the following is the error related to image below?



- (1). IP (Image Plate) Error
- (2). CR Reader Error
- (3). Network Error
- (4). Compression Error

Q119. Which of the following is related to image below?



- (1). Illuminator Calibration
- (2). Virus Checking
- (3). Monitor Calibration
- (4). Server Checking

Q120. Which of the following is not correct about HL7?

- (1). Its international standard to interchange information among medical information systems electrically.
- (2). Its communication standard of medical information field used all over the world.
- (3). Its open type standard developed by medical workers and medical information developers.
- (4). Its message transmission standard to connect with various modalities that has different image information.

Q121. Which of the following is not true about DQE (Detective Quantum Efficiency)?

- (1). Measurement of signal and noise
- (2). If DQE value is high, dose increases.
- (3). If DQE value is high, image quality becomes higher.
- (4). DQE is method to measure image quality with MTF

Q122. Which of the following is correct at the High Pass Filtering image below?

9	8	3	2
8	8	3	2
3	3	3	2
2	2	2	2

 \times

0	-1	0
-1	5	-1
0	-1	0

 $=$

			a
	b		

- | | |
|-----------------------|-----------------------|
| (1). a: 3, b: -1 | (2). a: 9, b: 5 |
| (3). a: -3, b: 0 | (4). a: 2, b: -2 |

Q123. Which of the following is not correct about ping test method?

- (1). Ping 166.171.101.104
- (2). Ping www.naver.com
- (3). Ping/t 5 166.171.101.104
- (4). Ping/l 500 166.171.101.104

Q124. Which of the following is not the basic three colors that consists the color image?

- | | | | |
|----------|------------|-----------|-------------|
| (1). Red | (2). Green | (3). Blue | (4). Yellow |
|----------|------------|-----------|-------------|

Q125. Which of the following is the proper compression method for medical image in the DICOM compression method?

- | | |
|---------------------|------------------------|
| (1). JPEG | (2). G3/G4 compression |
| (3). Huffman coding | (4). None of the Above |

Q126. Which of the following is the sampling width?(f_{max} =maximum frequency)

- | | |
|--------------------------------------|--------------------------------------|
| (1). Sampling width = f_{max} | (2). Sampling width = $1/(2f_{max})$ |
| (3). Sampling width = $1/(3f_{max})$ | (4). Sampling width = $1/(4f_{max})$ |

Q127. Which of the following is not true about Median filter?

- (1). It is used for noise elimination in the image.
- (2). After sorting pixel density value and chooses the median value.
- (3). Edge detection is possible.
- (4). The image is blurred.

Q128. Which of the following is TRUE about the size of the image?

- (1). Data of fixed image = (pixel numbers of horizontal direction) × (pixel numbers of vertical direction) × (bit number of pixel)
- (2). Data of moving image = (pixel numbers of horizontal direction) × (pixel numbers of vertical direction) × (frame rate per second)
- (3). The size of digital image of 600 pixel of width and 800 pixel of lengthwise and 24 bits color is $600 \times 800 = 400,000$ bits.
- (4). Data of fixed image = (pixel numbers of horizontal direction) × (pixel numbers of vertical direction) × (gray scale numbers of pixel)

Q129. Which of the following is the correct order of difficulty occurrence in Network management?

- (1).difficulty acceptance - trouble search - difficulty recovery - follow-up measures
- (2).difficulty acceptance – trouble search – follow-up measures – difficulty recovery
- (3).difficulty acceptance - difficulty recovery - trouble search - follow-up measures
- (4).trouble search - difficulty acceptance - difficulty recovery - follow-up measures

Q130. Which of the following is included in Network Layer 3 of OSI?



- (1). Hub
- (2). Repeater
- (3). Router
- (4). Bridge

Q131. Which of the following represents the highest capability against the trouble?

- (1). RAID 3
- (2). RAID 4
- (3). RAID 5
- (4). RAID 6

Q132. Which of the following is the basic unit of data storage in Database?

- (1). File
- (2). Record
- (3). Index
- (4). Cluster

Q133. Which of the following is the basic when connected with PACS that makes it possible to transfer the image to the PACS server?

- (1). DICOM Query/Retrieve SCU/SCP
- (2). DICOM Print SCU
- (3). DICOM Storage SCP
- (4). DICOM Storage SCU

Q134. Which of the following is the unique value of matching standard between patient information and image information that has maximum digits of 16?

- (1). Accession NO
- (2). Patient ID
- (3). Patient Name
- (4). Study Key

Q135. Which part is the Security Profile in DICOM?

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

Q136. Which of the following is not correct about the window width and windows level in CT image?

- (1). The Window Width is the range of Gray Scale range of CT Number
- (2). The Window Width controls the contrast of images
- (3). The Window Level means the median of the Gray Scale
- (4). If Window Level is high, it is expressed close to the air which has little absorption of X-ray.

Q137. Which of the following statements about quantization in A/D conversions is incorrect?

- (1). Sampling takes place after quantization.
- (2). It is a conversion to digital data.
- (3). It contains quantization errors.
- (4). Density resolution is determined by the number of bits for quantization.

Q138. Which of the following descriptions about image format is correct?

- (1). BMP and XML are generally used image formats.
- (2). JPEG is an abbreviation for Joint Photographic Extensible Graphics.
- (3). TIFF is an image format that specifies image resolution and compression method on a tag.
- (4). JPEG 2000 achieves its high compression and high image quality based on the WAVE format.

Q139. If one of the disks that make up RAID malfunctioned, which one of the following cannot be accessed for data?

- a · RAID-0
- b · RAID-1
- c · RAID-5

- (1). a
- (2). b
- (3). c
- (4). All of the above

Q140. How many bits are 40 bytes equivalent to?

- (1). 5 bits
- (2). 32 bits
- (3). 320 bits
- (4). 500 bits

Q153. All of the following are input or output devices except a:

- (1). Video display monitor.
- (2). Keyboard.
- (3). CPU.
- (4). Modem.

Q154. The most updated version of HL7 is:

- (1). V3.0
- (2). V3.7
- (3). V4.5
- (4). V5.1

Q155. What is the storage capacity of a RAID 5 system with five 500G hard disk?

- (1). 4T
- (2). 2.5T
- (3). 2T
- (4). 1T

Q156. The development of Linux is based on:

- (1). OS/2
- (2). Window
- (3). Basic
- (4). Unix

Q157. Which is the undesirable behavior of a MIIA?

- (1). Provide training to the PACS users
- (2). Monitor the performance of the PACS
- (3). Modify the patient data without documentation
- (4). None of the above

Q158. DICOM provides an abstract definition, which of the following can describe the necessary information of the image.

- (1). Instance UID
- (2). IOD
- (3). IDD
- (4). IID

Q159. The image gray scale value is 563, what is its binary value?

- (1). 1000110011
- (2). 1000101011
- (3). 1000110101
- (4). 1000110010

Q160. When the pixel size is 0.2 mm, what is the associated spatial frequency?

- (1). 25 lp/mm
- (2). 5 lp/mm
- (3). 2.5 lp/mm
- (4). 1 lp/mm

Q161. Which set is the best for CT lung field presentation?

- (1). window width 400, level 50
- (2). window width 50, level 400
- (3). window width 1500, level -500
- (4). window width -500, level 1500

Q162. What kind of image compression algorithm is used for supporting JPEG2000 ?

- (1). JPEG
- (2). Run-length coding
- (3). Wavelet
- (4). Huffman coding

Q163. What is a subnet mask use in a class C computer is_____.

- (1). 127.0.0.1
- (2). 255.255.255.0
- (3). 255.255.0.0
- (4). 172.16.0.1

Q164. What type of network media is appropriate to connect two computers with 2 Km distance without using a repeater?

- (1). Cat 5
- (2). Cat 6
- (3). STP
- (4). Fiber Optic

Q165. What does the storage model refer to this figure?



- (1). Storage Area Network
- (2). Local Area Network
- (3). Direct Attach Storage
- (4). Network Attach Storage

Q166. How many bits are required to represent a 1024 stage contrast resolution?

- (1). 2 bit
- (2). 4 bit
- (3). 8 bit
- (4). 10 bit

Q167. What is 4 bytes in bits?

- (1). 8 bits
- (2). 16 bits
- (3). 24 bits
- (4). 32 bits

Q168. What does the prefix "T" in a unit mean?

- (1). 10^6
- (2). 10^9
- (3). 10^{12}
- (4). 10^{15}

Q169. What happens when only the quantization bit rate is changed from 10 bits to 8 bits?

- (1). The volume of image data (in kB) becomes 50%.
- (2). The volume of image data (in kB) becomes 64%.
- (3). The volume of image data (in kB) becomes 80%.
- (4). The volume of image data (in kB) does not change.

Q170. Choose the item that is least likely to be used for data retrieval on the viewer.

- (1). Examination date
- (2). Accession No.
- (3). Patient ID number
- (4). Modality

Q171. Choose the wrong statement about RAID 1.

- (1). It is called mirroring.
- (2). Identical data are written on two different disks.
- (3). The volume of data recordable is twice the total capacity of the disks.
- (4). Data can be restored even if one of the disks fails.

Q172. What is the data volume of a 12-bit 512x512 image?

- (1). 262 kB
- (2). 524 kB
- (3). 1048 kB
- (4). 2096 kB

Q173. What is the data volume of the image obtained by reversibly compressing a 12-bit 512x512 image to 1/2 size?

- (1). 262 kB
- (2). 524 kB
- (3). 1048 kB
- (4). 2096 kB

Q174. Assuming that a computer tomography (CT) scanner is operated for 300 days per year, about 20 examinations are conducted per day, an average of 100 images are produced in one examination, and each CT image obtained is a 12-bit 512x512 image, what will be the most likely volume of the image data produced annually?

- (1). 160 GB
- (2). 320 GB
- (3). 640 GB
- (4). 1280 GB

Q175. Assuming that every image is compressed to a ratio of 1/2 in the case of Question 8, what will be the capacity of a server required to store the images produced in five years?

- (1). 500 GB
- (2). 800 GB
- (3). 1 TB
- (4). 2 TB

Q176. Choose the term that is not explained in the DICOM Standard.

- (1). MWM
- (2). MPPS
- (3). RAID
- (4). GSDF

Q177. Which monitor is suit for mammography images display?

- (1). 1K monitor
- (2). 2K monitor
- (3). 4K monitor
- (4). All of the above

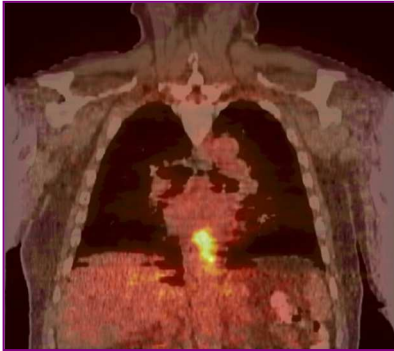
Q178. Which of the following is used for erasing of CR modality?

- (1). Blue light
- (2). White light
- (3). Semiconductor light
- (4). Visual light

Q179. Which of the following DICOM tags is a private tag?

- (1). (0008,0008)
- (2). (0008,1010)
- (3). (0010,1022)
- (4). (0009,0010)

Q180. The following image is a compound image of PET and CT. Which of the following technique is used?



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

Q181. What is the image volume of a color endoscopy image (640x480, 24-bit)?

- (1). About 300 [KB]
- (2). About 620 [KB]
- (3). About 930 [KB]
- (4). About 1230 [KB]

Q182. Which of the following is not computer's operating system?

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

Q183. Which of the following is not correct when CD copy has been made for sending patient image data?

- (1). To confirm the patient information
- (2). To made the images without compression
- (3). The images could be burned regardless of compression
- (4). The identification must be showed when carry the CD.

Q184. MDCT makes() possible which is enable under 1mm () axis resolution better. That is a foundation of 3D diagnostic image. Fill in the blanks.

- (1). X, Isotropic Voxel
- (2). Z, Isotropic Voxel
- (3). Z, Non - Isotropic Voxel
- (4). Y, Non - Isotropic Voxel

Q185. High-pass convolution filter would most likely be used to image?

- (1). bone-lung
- (2). cartilage-muscle
- (3). gray matter-white matter
- (4). muscle-fat

Q186. What of the operating convert from continuous data to discrete data?

- (1). quantization
- (2). scanning
- (3). compression
- (4). reconstruction

Q187. Which of the following is the sampling width? (f_{\max} = maximum frequency)

- (1). Sampling width = f_{\max}
- (2). Sampling width = $\frac{1}{2 \times f_{\max}}$
- (3). Sampling width = $\frac{1}{3 \times f_{\max}}$
- (4). Sampling width = $\frac{1}{4 \times f_{\max}}$

Q188. Which of the following is most likely TRUE about the Cache memory?

- (1). It has bigger capability than RAM memory.
- (2). It is kind of control unit of system.
- (3). It is kind of auxiliary memory.
- (4). It stores the program or data which is used frequently.

Q189. When the medical equipment is not support the DICOM, which of the following is used to PACS systems?

- | | |
|-----------------|-------------------------|
| (1). HL7 Broker | (2). Acquisition Server |
| (3). Storage | (4). DICOM Gateway |

Q190. Which of the following is related to value of modulation transfer function (MTF) in high frequency level?

- | | |
|-----------------------|-------------------------|
| (1). Image noise | (2). Image linearity |
| (3). Image uniformity | (4). Spatial resolution |

Q191. Which of the following explanation is correct about Association?

- (1). It is communication for preliminary inspection before exchange real data with DICOM.
- (2). It is communication to report the complete condition when image receiving is finished from DICOM storage.
- (3). It is communication to automatically send the images which is received external device to another device.
- (4). It is service class when DICOM data is recorded at HDD or DVD.

Q192. Which of the following explanation is incorrect about JPEG(Joint Photograph Expert Group) technology?

- (1). JPEG is international standard for compression and conservation of still images.
- (2). When lossless compression is implemented by JPEG, the data volume would be a fiftieth part (1/50).
- (3). Huffman coding is typically used in JPEG format.
- (4). Every JPEG file is started with Start of Image (SOI) marker.

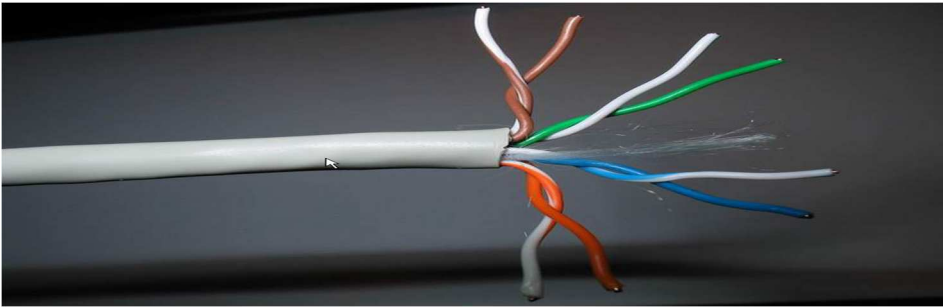
Q193. Which of the following explanation is incorrect about Ethernet?

- (1). Ethernet is standardized by IEEE 802.3 committee.
- (2). 100 BASE is called Fast Ethernet.
- (3). CDMA(Code Division Multiple Access)is adopted for access control.
- (4). Ethernet is used for bus type and star type network

Q194. Which of the following is incorrect explanation about the LAN?

- (1). The terminal or network devices which is connected to LAN is called node.
- (2). The unit of logical LAN is called segment.
- (3). It is possible to make same node address in same segment.
- (4). The maximum length of LAN per segment is fixed by transmission component

Q195. What is the image below?



- (1). shielded twisted pair cable
- (2). unshielded twisted pair cable
- (3). coaxial cable
- (4). fiber optic cable

Q196. Which of the following network topology is incorrect?

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

Q197. What is not able to figure out from the histogram of digital image?

- (1). The number of pixel on certain density
- (2). Density distribution
- (3). The location of certain density
- (4). The density of a certain pixel

Q198. What is a wrong explanation to deal with error about PACS operation system?

- (1). The company installed PACS have to take a solution for error.
- (2). The hospital have to have managerial regulation.
- (3). User's mistake is not including.
- (4). The solution need to be including not only server and hardware error also user's mistake.

Q199. Which following is not correct evaluation when monitor test by using AMPTE test pattern?

- (1). 50% APL pattern
- (2). Cross pass pattern
- (3). Noise
- (4). Gray scale

Q200. What is not correct evaluation for monitor test?

- (1). spatial distortion
- (2). spatial resolution
- (3). surrounding environment
- (4). ping test

Q201. It expresses to DICOM header, what is matched with delivered information to PACS as a specific number

- (1). UID
- (2). DIMSE
- (3). SOP
- (4). Accession number

Q202. What is the TAG to figure out whether DICOM file zipped and the method.

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

Q203. What is the wrong explanation about MTF (modulation transfer function)

- (1). This is a function how much it can transfer 100% information in the black box to photocell.
- (2). MTF is always less than 1.
- (3). When local frequency is low, MTF is also low.
- (4). It can be measured at each local frequency.

Q204. Which of the following performance is not needed for image detector?

- (1). Spatial resolution, gray-scale resolution and temporal resolution should be high.
- (2). Exposure dose should be low.
- (3). Detective area should be narrow.
- (4). Lifetime should be long, and stability should be high.

Q205. Which of following is not purview to NMS(network management system) offered?

- (1). organization
- (2). performance
- (3). storage
- (4). error

Q206. What is the measure to use luminance meter?

- (1). lx
- (2). cd/m^2
- (3). lm
- (4). W

Q207. Which following is not correct intuitive check evaluation of representative test pattern TG18-QC of AAPM?

- (1). geometric distortion
- (2). Lx
- (3). luminance response
- (4). spatial resolution

Q208. What is the ability that is able to exchange error disc during RAID disc working?

- (1). Mirroring
- (2). Hot swap
- (3). Striping
- (4). Plug & play

Q209. This equipment below picture is connected to network directly. It works like network server because it has OS and network control device. What is file server's name?



- (1). DAS
- (2). NAS
- (3). SAN
- (4). DRS

Q210. What is below picture showing?

(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	1.3.12.2.1107.5.4.4.012
(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). DICOM Header Information
- (2). DICOM conformance statement
- (3). Transfer Syntax
- (4). HL7 Message

Q211. (12)10+(11)10=

- (1). (10011)2
- (2). (10111)2
- (3). (11011)2
- (4). (11101)2

Q212. Which one kind of network agreement for Internet use?

- (1). TCP/IP
- (2). IPX/SPX
- (3). NetBEUI
- (4). X.25

Q213. DICOM with the communication agreement is ?

- (1). TCP/IP (2). IPX (3). NetBEUI (4). X.25

Q214. Which one is the correct IP address ?

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

Q215. Commonly known as the 9 bit per pixel images, the grayscale value is ?

- (1). 0~255 (2). 0~511 (3). 0~1023 (4). 0~2045

Q216. Which display is the most appropriate CR and DR images ?

- (1). 1MP (2). 2MP (3). 3MP (4). 5MP

Q217. Which of the following compression formats is DICOM standard compression format?

- (1). JPEG (2). JPEG200 (3). JPEG2000 (4). JPEG2007

Q218. Following item with the PACS storage devices irrelevant ?

- (1). RAID (redundant array of inexpensive disks)
(2). digital optical cartridge tape - LTO
(3). film
(4). DVD-ROM

Q219. Which of the following is the text exchange of standards?

- (1). HIPPA (2). HL7 (3). DICOM (4). LOINC

Q220. Which of the following is specially designed for file transfer in internet?

- (1). WWW (2). FTP (3). ARCHIE (4). TELNET

Q221. How long does it take to transfer a 2 Mbytes file with a transfer rate of 33.6 Kbps?

- (1). 24 min (2). 80 min (3). 80 sec (4). 8 min

Q222. Which of the following is one of the DICOM service classes?

- (1). storage class (2). print class
(3). query/retrieve class (4). All of the above

Q223. The spatial resolution in x-ray films is lps/mm, in digital images will be:

- (1). bit/mm (2). byte/mm (3). pixel/mm (4). bps/mm

Q224. When the detail of the image is improved, the image contrast will be ?

- (1). remained unchanged (2). increased
(3). decreased (4). all of the above.

Q225. Which of the following does NOT belong to the PACS fundamental framework?

- (1). Image Acquisition
- (2). Internet
- (3). Image Archive / Storage
- (4). Image Viewer / Display

Q226. Which of the following is NOT the file management system for medical records?

- (1). Centralized file Management
- (2). Hierarchical file management
- (3). Distributed file management
- (4). Satellite file management

Q227. The regulations of electronic medical records are governed by:

- (1). Medical Care Act
- (2). Electronic Signatures Act
- (3). Hospital accreditation operating policy
- (4). Physicians Act

Q228. According to the "Medical Care Act" amended in 2004, the medical records shall be retained for:

- (1). 3 years.
- (2). 4 years.
- (3). 7 years.
- (4). 10 years.

Q229. Which one of the following regulations regarding the retention of medical records is NOT true?

- (1). Health care organizations which are authorized to perform physical examinations do not need to retain the exam records.
- (2). When health care clinics cease practice, they shall transfer the medical records to the previous attending physicians.
- (3). Hardcopy of medical records can be destroyed after epitomized storage
- (4). Significant data recorded from monitors can be partly acquired for data storage.

Q230. The encode system which provides the framework and standards of exchanging, integration, sharing and review of medical information is:

- (1). DRG
- (2). HL-7
- (3). DICOM
- (4). LOINC

Q231. Which of the following system providing the signatures, encryption and timestamp functions for electronic records?

- (1). HCA
- (2). HL7
- (3). DICOM
- (4). HIS

Q232. Which one of the following is TRUE regarding the medical records in Taiwan?

- (1). Physicians are the people who provide medical information.
- (2). Patients are one of those who give the records.
- (3). The hardcopy of the medical records belongs to hospitals.
- (4). According to "Medical Care Act", the medical records shall be retained at least 15 years.

Q238. To establish the hospital information system for electronic medical records, health care organizations shall comply the following regulations EXCEPT?

- (1). A backup for electronic records
- (2). Effective system failure recovery and emergency management mechanism.
- (3). Adequate software and hardware for the protection and safety of the electronic records information system.
- (4). All of above.

Q239. The medical records in health care organizations should be stored in designated appropriate location supervised by appointed personnel. How many years shall be retained?

- (1). 5 years.
- (2). 7 years.
- (3). 10 years.
- (4). Retained indefinitely.

Q240. How many years shall be retained the medical records for patients under age 18?

- (1). 7 years.
- (2). 10 years.
- (3). 7 years after being adult
- (4). 10 years after being adult

Q241. How many years shall be retained for the medical records of human trials?

- (1). 5 years
- (2). 7 years
- (3). 10 years
- (4). Retained indefinitely.

Q242. Person under the violation of article 68 (documentation in medical records) in “Medical Care Act”:

- (1). shall be subject to a fine of no less than NT\$100,000 but no more than NT\$500,000 and given a time limit to cease the law-violating act; persons who do not comply shall be subject to a successive fine.
- (2). shall be subject to a fine of no less than NT\$50,000 but no more than NT\$100,000 and given a time limit to cease the law-violating act; persons who do not comply shall be subject to a successive fine.
- (3). shall be subject to a fine not less than NT\$10,000 and not more than NT\$50,000 and given a time limit to cease the law-violating act; persons who do not comply shall be subject to a successive fine.
- (4). Notification by person.

Q243. According to article 71 in “Medical Care Act”, the health care organizations shall provide the copies of medical records to patients under the following conditions EXCEPT:

- (1). Health care organizations shall give the copy whenever the patients request.
- (2). Provide Chinese summary of medical records when necessary.
- (3). Shall not delay or refuse without cause
- (4). The fee for the copy of medical records shall be paid by the patient.

Q244. Medical Institute should supervise clinical staffs in executing the clinical work by

- (1). asking someone to write their dictation then signature
- (2). asking other workers to note down
- (3). recording the medical chart personally
- (4). writing the notes in code name and recording the execution date (y/m/d).

Q245. According to rule 71 Medical Treatment Regulations, Medical Institute have to provide duplication of medical chart and Chinese abstract of medical history immediately when patients need them. However, who have to afford the expenditure?

- | | |
|---------------------------|--|
| (1). patients | (2). Medical Institute |
| (3). Public Health Bureau | (4). Bureau of National Health Insurance |

MIIA

1. Which of the following is NOT the operating system (OS)?

- a) DOS
- b) Windows
- c) UNIX
- d) Active X

2. What is the minimal unit for single alphabetic addressing?

- a) 1 bit
- b) 4bit
- c) 1 byte
- d) 4 byte

3. What does the 'T' mean as a unit of data capacity?

- a) 10^6
- b) 10^9
- c) 10^{12}
- d) 10^{15}

4. Which of the following is the Wrong statement for RAM and ROM?

- a) RAM can store programs or data in any place.
- b) ROM can read the data that is stored but can't erase.
- c) Both of them are not extinctive memory.
- d) Generally the main memory unit consists of the RAM and ROM.

5. (The outside) what of the following range can't be expressed by '8bits'?

1. 0~128	2. 0~196	3. 0~256
----------	----------	----------

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

6. What is the expression unit at the coding stage in the digitization process?

- a) Hz
- b) byte/sec
- c) byte
- d) bit

7. Which of the following is the Right order from the subordinate concept to the super ordinate concept?

- a) Character (word) → Record → File → Field
- b) File → Record → Field → Character (word)
- c) Record → Field → File → Character (word)
- d) Character (word) → Item → Record → File

8. (The outside) which of the following can transmit or receive the input through the small IC chip?

- a) Bluetooth
- b) IrDA
- c) RFID
- d) Wi-Fi

9. What is the detector constituent element in the direct DR modality?

- a) CsI

- b) CCD
- c) Amorphous Silicon
- d) Amorphous Selenium

10. Which of the following can be used for latent image removal in the CR system?

- a) Blue laser b) White laser c) Semiconducting laser d) Visible ray

11. What is the phosphor constituent element of the IP?

- a) ZnCdS b) BaFbR : Eu ²⁺ c) CsI d) CaWO4

12. What is the main reason that most flat panel detector use the CSI in the indirect detection system?

- a) Because of the indirect detector characteristic.
- b) Because it is suitable for equipment performance evaluation.
- c) Because scattered ray occurrence is less than other fluorescent substance.
- d) Because it can make electric signal directly

13. Which of the following can be used at the CR image interpretation?

- a) Blue laser b) White laser c) Semiconducting laser d) Visible ray

14. The MDCT can make ()'s () axis resolution under 1mm so it can diagnose the 3D images well. Fill in the blanks.

- a) Isotropic Voxel, X
- b) Isotropic Voxel, Z
- c) Non – Isotropic Voxel, Z
- d) Non – Isotropic Voxel, Y

15 What is the reason that most flat panel are using CSI in indirect detector?

- a) because of the indirect detector characteristic.
- b) because It is suitable for equipment performance evaluation.
- c) because scattered ray occurrence is less than other fluorescent substance.
- d) because It can make electric signal directly

16. Which of the following is the Right answer as a principle of the indirect digital radiography system?

X-rat energy -> () -> electric signal

- a) Indirect energy b) Direct energy c) Scattering energy d) Light energy

17. Which of the following modality can gain the accurate signal without the stage of declining image quality?

- a) DR (direct digital radiography)
- b) DR (indirect digital radiography)
- c) S/F (screen/film)
- d) DRF (digital radiographic fluoroscopy)

18. Which of the following requires the highest resolution for reading?

- a) CT
- b) MRI
- c) CR
- d) Digital fluoroscopy

19. What dose the '7200 RPM' mean at the Hard disk?

- a) The plates rotate 7200 times per minute.
- b) The average access time is 7200 ms.
- c) The maximum data recording speed is 7.2 GB per minute.
- d) This hard disk has 7200 sectors.

20. When you bind 5 500GB HDD by 'RAID 5', what is the date capacity?

- a) 0.5 TB
- b) 1 TB
- c) 2 TB
- d) 2.5 TB

21. This can make several Hard Disks recognized as one to overcome the physical limit of the DISK. What is this?

- a) SCSI
- b) RAID
- c) IDE
- d) SAN

22. Which of the following is NOT related to RAID?

- a) Striping
- b) Parity
- c) Hot Spare
- d) Byte Swap

23. Which of the following is the strongest against the failure?

- a) RAID 3
- b) RAID 4
- c) RAID 5
- d) RAID 6

24. Which of the following is mainly used for short-term storage device?

- a) DISK Array
- b) DVD
- c) MOD
- d) TAPE

25. What is the basic unit of data storage?

- a) File
- b) Record
- c) Index
- d) Cluster

26. This is a storage that is connected to network directly and because it has its own OS and network configuration system, it works as a network file server. What is this?



- a) DAS
- b) NAS**
- c) SAN
- d) DRS

27. What is the image data capacity of 1024 X 1024 X 12bit?

- a) 1Mbyte
- b) 1.5Mbyte**
- c) 2Mbyte
- d) 2.5Mbyte

28. (The outside) what is the image data capacity when the 512 × 512 image of 16 bit is compressed to 2:1?

- a) Approximately 262 k byte**
- b) Approximately 524 k byte
- c) Approximately 1024 k byte
- d) Approximately 2096 k byte

29. When the Worklist cannot be queried, which of the following is NOT the checklist of the PACS server?

- a) Worklist Service
- b) Acquisition Service**
- c) Broker Service
- d) Database

30. (The outside) which of the following is NOT related to DICOM standard?

- a) MWM (Modality Worklist Management)
- b) MPPS (Modality Performed Procedure Step)
- c) RAID (Redundant Array of Independent Disk)**
- d) GSDF (Grayscale Standard Display Function)

31. There are DICOM Tags. Which is a Private Tag?

- a) (0008, 0008)
- b) (0008, 1010)
- c) (0010, 1020)
- d) (0009, 0010)**

32. (The outside) this is expressed at the DICOM header and is the own value of that examination and is the standard of matching between order information and image on the PACS. What is this?

- a) Examination date
- b) Accession No
- c) Patient ID
- d) Modality

33. The one process works as an interface after directly accesses different servers. What is this?

- a) Worklist
- b) HIS
- c) Broker
- d) Clustering

34. It makes the image transferred to PACS server and is the basic of PACS connection. What is this?

- a) DICOM Query/Retrieve SCU/SCP
- b) DICOM Print SCU
- c) DICOM Storage SCP
- d) DICOM Storage SCU

35. At least 2 servers are performing each task at normal times. When one server is failed, other server covers that server and that task. As a whole the tasks don't stop. What is this technique called?

- a) Clustering
- b) SAN
- c) DAS
- d) NAS

36. Which header information does the following picture show?

(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	1.3.12.2.1107.5.4.4.01
(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

- a) PACS
- b) HL7
- c) IHE
- d) DICOM

37. (The outside) which of the following is the communication protocol of DICOM standard ?

- a) TCP/IP
- b) IPX
- c) NetBEUI
- d) X. 25

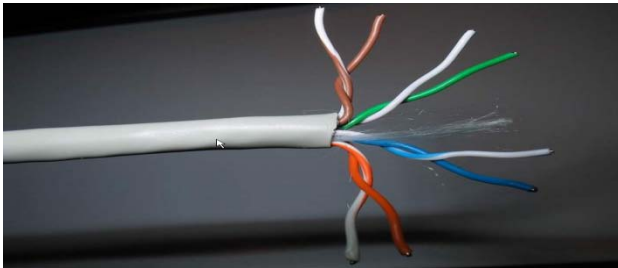
38. Which of the following image information processed the other way?

- a) Import
- b) Scan
- c) Film print
- d) DICOM gateway

39. Which of following CANNOT be offered by NMS (network management system)?

- a) Organization
- b) Performance
- c) Storage
- d) Error

40. What does the following picture represent?



- a) Shielded twisted pair cable
- b) Unshielded twisted pair cable
- c) Coaxial cable
- d) Fiber optic cable

41. Which of the following interface can be connected by RJ-45?

- a) Serial port
- b) Analog monitor
- c) USB
- d) LAN cable

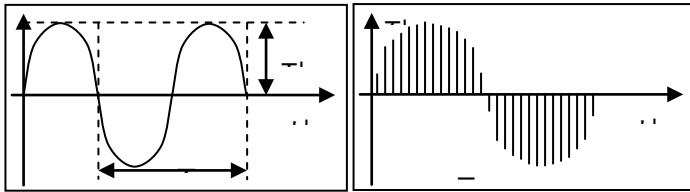
42. Which of the following is NOT a correct ping test method?

- a) Ping /t 5 166.171.101.104
- b) Ping www.naver.com
- c) Ping 166.171.101.104
- d) Ping /l 500 166.171.101.104

43. (The outside) which of the following device connects the separated field`s network each other through the same transmission protocol?

- a) Hub
- b) Repeater
- c) Bridge
- d) Router

44. Like the following pictures, what is the process called to convert the continuous spatial and temporal image data to discrete signal?



- a) **Sampling**
- b) Quantization
- c) Scanning
- d) Compression

45. Which of the following has the fastest communication speed?

- a) 10BASE
- b) **Gigabit Ethernet**
- c) Fast Ethernet
- d) Ethernet

46. What is the spatial frequency when the pixel size is 0.2mm?

- a) 4 lp/mm
- b) 3.5 lp/mm
- c) **2.5 lp/mm**
- d) 1.5 lp/mm

47. Which of the following compression technique is used at JPEG2000?

- a) **Wavelet**
- b) Run-length coding
- c) JPEG
- d) Huffman coding

48. Among the predictive compression techniques, which of the following uses the characteristic that when recording the pixel values, the values between adjacent pixels are not significantly different?

- a) DCT (decrete cosine transform)
- b) **DPCM (difference pulse coded modulation)**
- c) PCM (pulse coded modulation)
- d) Wavelet transform

49. Which of the following is NOT related to lossy compression?

- a) DCT (decrete cosine transform)
- b) The principle of equalizer in audio equipment.
- c) **Pursuit of perfect restoration in image.**
- d) Sorting the data in the order of importance of information delivery

50. Which of the following is mathematically the same before compression when the compressed image is decompressed?

- a) JPEG
- b) JPEG2000
- c) MPEG
- d) **Run-Length**

51. (The outside) which of the following is CORRECT when the quantization bit rate is changed from 9bits to 8bits?

- a) The volume of image data decreases to 50%.
- b) The volume of image data decreases to 25%.
- c) The volume of image data decreases to 15%.
- d) The volume of image data decreases to 5%.

52. When the spatial frequency is 10 lp(line pairs)/mm, which of the following is CORRECT?

- a) There are ten lines in 1mm.
- b) There are 10 black lines and 10 white lines in 1mm.
- c) Line pairs means there is only one line.
- d) There are twenty sine waves.

53. Which of the following is NOT the signal of the digital image?

- a) Continuous value
- b) Single value
- c) Sampling value
- d) Mean value

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

- a) Bone and lung
- b) Cartilage and muscle.
- c) White and gray matter
- d) Muscle and fat.

55. Which of the following is the process to convert the continuous image density to discrete value?

- a) Quantization
- b) Compression
- c) Scanning
- d) Reconstruction

56. Which of the following is NOT related to the histogram of digital image?

- a) Location of specific pixel.
- b) Distribution of density
- c) Pixel numbers of specific density
- d) Density value of a pixel

57. What is the process called to convert the continuous spatial and temporal image data like an audio signal to discrete signals?

- a) Sampling
- b) Quantization
- c) Scanning
- d) Compression

58. Which of the following is NOT correct about DQE (Detective Quantum Efficiency)?

- a) DQE value can measure both signal and noise.
- b) If DQE value is high, the radiation dose of object is high.
- c) If DQE value is high, the quality of X-ray image is high.
- d) DQE is one of the methods for measurement of image quality

59. Which of the following is NOT a lossless compression?

- a) Run-Length method
- b) Cosine Transform
- c) Entropy coding
- d) Prediction

60. Which of the following is NOT a correct parameter to get an excellent 3D image?

- a) Enough slice numbers
- b) High Matrix Size
- c) Wide Z axis Resolution
- d) A decrease of breath and moving artifact

61. Which of the following method is called 'Threshold Rendering' which is based on the binary scale that represent the object surface through the geometric calculation to connect the pixels which has stronger intensity than predetermined threshold?

- a) Surface rendering
- b) Volume rendering
- c) Multiplanar reformation
- d) Virtual Endoscopy

62. Which of the following is related to MTF (Modulation Transfer Function) in High-frequency region?

- a) Image noise
- b) Image linearity
- c) Image uniformity
- d) Spatial resolution

63. Which of the following is NOT correct about MTF (Modulation Transfer Function)?

- a) If the MTF value is high, the sharpness is high.
- b) If the MTF value is high, the noise increases.
- c) If the sensitivity of system is high, the MTF value is low.
- d) If the MTF value is high, the object can be recognized well.

64. Which of the following process adds or subtracts a specific constant to total luminance value of the original image?

- a) Histogram stretching
- b) Histogram sliding
- c) Histogram uniformity
- d) Histogram smoothing

65. Which of the following is NOT an evaluation item for the monitor check using SMPTE test pattern?

- a) 50% APL pattern
- b) Cross pass pattern
- c) Noise
- d) Gray scale

66. Choose the correct method for Quantitative test of noise?

- a. TG18-UNL80
- b. SNR (signal to noise ratio)
- c. Line pair test
- d. NPS (noise power spectrum)

- a) a, c
- b) a, b, c
- c) b, d
- d) a, b, d

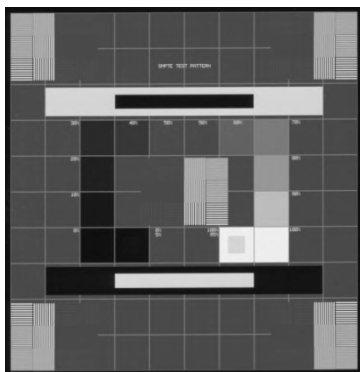
67. Which of the following is related to the standard guideline for performance evaluation of medical image in AAPM (American Association of Physicists in Medicine)?

- a) AAPM Task Group 15
- b) AAPM Task Group 16
- c) AAPM Task Group 17
- d) AAPM Task Group 18

68. Which of the following is NOT related to IHE?

- a) DICOM
- b) Standardization of network
- c) Connection
- c) HL7

69. Which of the following is NOT related to the below picture?



- a) Monitor
- b) Regular maintenance is important by planned Chart.
- c) Grid
- d) SMPTE Test Pattern

70. Which of the following is the hardware for the interface between the monitor and the Viewing Software?

- a) Graphic Card
- b) Connection Cable
- c) Main Board
- d) C P U

71. Which of the following is CORRECT definition about the distance from dot to dot in monitor plate?

- a) Resolution
- b) Refresh Rate
- c) Brightness
- d) Dot pitch

72. Which of the following is the resolution of general medical monitor of 5M pixel?

- a) 2048×2560
- b) 1600×3072
- c) 1200×4096
- d) 1024×4960

73. Which of the following is NOT a main function of Clustering in server?

- a) Share the data when power outage
- b) Share the network IP Address and computer name
- c) Share the DISK Array
- d) Share the Application Software

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

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

75. Which of the follow is NOT a monitor checklist?

- a) AEC measurement
- b) Spatial resolution
- c) Surrounding environment
- d) Spatial distortion

76. Which of the following is the WRONG sentence when the patient image data is copied to CD and exported?

- a) The image must be made using lossless compression techniques to increase speed.
- b) The image is transformed to No compression state for CD copy.
- c) The accurate patient information is verified.
- d) The patient identity must be verified.

77. Which of the following is NOT a major consideration for operating PACS?

- a) Preparation of the error
- b) Security of PACS
- c) Manufacturing process of PACS
- d) Real image quality

78. Which of the following is NOT the cause of problem when Soft copy (CD Copy) imported?

- a) If standard DICOM DIR method is not supported.
- b) If the file is stored at the state of Lossy Compression.
- c) If the file is not the standard DICOM file.
- d) If it is a Gray image

79. Which is a database language as a Structured Query Language?

- a) NAS b) RDBMS c) SAN d) SQL

80. How many bits are required to represent a 1024 stage contrast resolution?

- a) 8 bit b) 10 bit c) 12 bit d) 16 bit

81. _____ is a component used to connect two separate applications in healthcare in order to enable information exchange, for example, Web server and a database management system.

- a) Web part b) XML c) HL7 d) Record

82. Which is a fixed computer network address that could not be changed by a user?

- a) Gateway b) DNS c) MAC Address d) Subnet mask

83. A loopback network address used to test internal network setting in a computer is_____.

- a) 127.0.0.1 b) 255.255.255.0
c) 192.168.0.1 d) 172.16.0.1

84. From the provided image, what is most likely type of this connector?



- a) VGA to VGA b) SVGA to VGA c) VGA to RGB d) DVI to RGB

85. Which is best describe the following image?

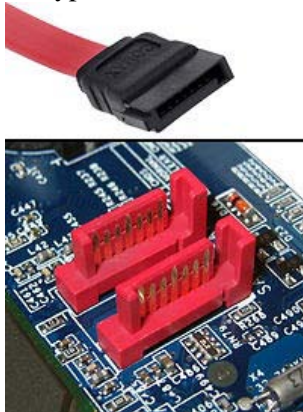
```
Pinging ibmt60 [127.0.0.1] with 32 bytes of data:
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Ping statistics for 127.0.0.1:
    Packets: Sent = 12, Received = 12, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
Control-C
^C
C:\>
```

- a) ping -a localhost b) arp localhost c) tracert localhost d) ping -t localhost

86. Which is an equivalent of a localhost network address used to test internal network setting of a computer?

- a) 255.255.255.0 b) 127.0.0.1
c) 192.168.0.1 d) 172.16.0.1

87. What type of the harddrive interface you can find in the market similar to this following image?



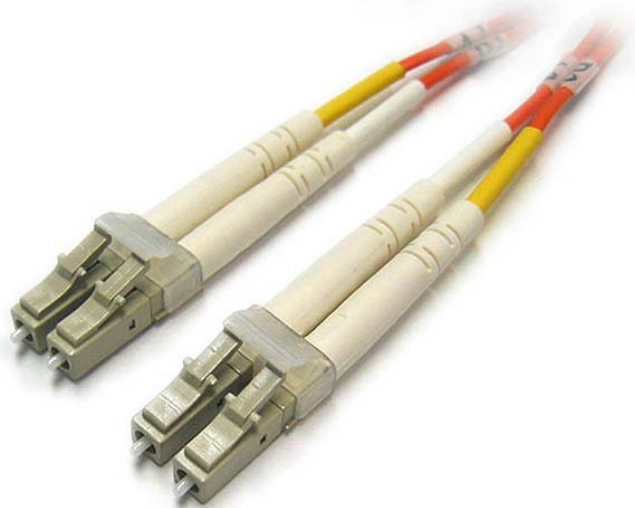
- a) SCSI b) SATA c) Fibra Channel d) IDE

88. What likely is the purpose of this following rack-mouth device designed for?



- a) **Storage System**
- b) File Transfer Server
- c) Proxy Server
- d) Dicom Server System

89. From the provided image, what is type of this cable?



- a) UTP
- b) STP
- c) DVI
- d) **Fibra Channel**

90. From the provided image, what is type of this device?



- a) **Power Supply**
- b) Rack-mouth UPS
- c) 1 U Server
- d) Storage Device

【問題1 回答1】

What are software and hardware that makes it possible to compress and decompress?

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

【問題2 回答3】

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

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

【問題3 回答1】

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)
- 2) MTF (Modulation Transfer Function)
- 3) Resolution
- 4) Capture Graphic Card

【問題4 回答2】

What kind of image compression algorithm is used for supporting Wavelet transform?

- 1) MPEG
- 2) JPEG 2000
- 3) Motion JPEG
- 4) JPEG

【問題5 回答1】

Which of the following compressing technique is defined to be suitable for medical image in loss and lossless compression techniques?

- 1) JPEG
- 2) G3/G4 compression
- 3) Huffman coding
- 4) Run-Length compression

【問題6 回答4】

What does 5lp/mm mean?

- 1) Black 5 lines in 1mm
- 2) White 5 lines in 1mm
- 3) Black 2.5, white 2.5 in 1mm.
- 4) Black 5, white 5 lines in 1mm

【問題7 回答4】

When the pixel size is 200 μ m, what is the spatial resolution?

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

【問題8 回答1】

Which of the following is applied to High-pass filter?

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

【問題9 回答2】

Which of the following is able to express to detailed changes of tissues?

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

【問題10 回答3】

What is a minimum unit of picture element?

- 1) Voxel
- 2) Matrix
- 3) Pixel
- 4) Record

【問題11 回答3】

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

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

【問題12 回答1】

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

【問題13 回答1】

入力Aが0、入力Bが1の時、出力結果の誤りはどれか？

Consider input A is 0 and input B is 1, which of the following outputs is FALSE?

1. A AND B = 1
2. A OR B = 1
3. NOT A = 1
4. A XOR B = 1

【問題14 回答4】

What is 1 byte in bits?

- 1) 2
- 2) 4
- 3) 6
- 4) 8

【問題15 回答2】

マトリックスサイズが2048×2048で、4096階調の濃度分解能をもつデジタル画像の画像容量 (Byte) として最も近いものはどれか選べ。

Given a matrix has a size of 2048 x 2048, which of the following best describes the digital image capacity (byte) with 4096 gradation density resolution?

1. 1.0MB
2. 8.3MB
3. 6.2MB
4. 17.0 MB

【問題16 回答3】

2進数(1011)₂を10進数に直すと、正しいのはどれか？

Consider converting from a binary number (1011) to a decimal number, which of the followings is TRUE?

1. 3
2. 10
3. 11
4. 13

【問題17 回答2】

画質評価の中で、粒状性の評価に用いられる項目はどれか？

Which of the following items is applied for the assessment of graininess in image evaluation?

1. MTF
2. NPS
3. ROC
4. DPC

【問題18 回答1】

画像の限界解像力を表す言葉はどれか？

Which of the following defines resolving limit and resolving power in terms of imaging?

1. ナイキスト周波数
 2. フーリエ変換
 3. コルトマン
 4. エリアシングエラー
1. Nyquist frequency
 2. Fourier transform
 3. Coltman
 4. Aliasing error

【問題19 回答4】

画像処理に使用するフィルタで含まれないのはどれか？

Which of the following is NOT included as a filter used in image processing?

1. 移動平均
 2. ラプラシアン
 3. ソーベル
 4. パケット
1. Moving average
 2. Laplacian
 3. Sobel
 4. Packet

【問題20 回答1】

次のうちMTFに影響を及ぼさないのはどれか？

Which of the following is NOT an influence on MTF?

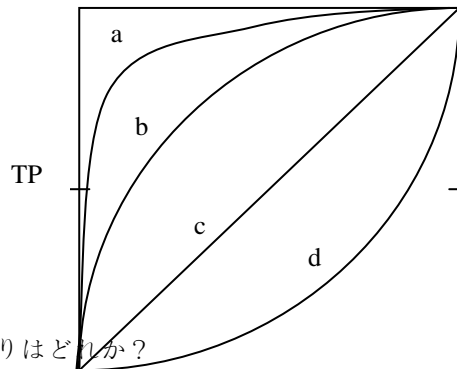
1. 管電圧
 2. 焦点サイズ
 3. 距離(SID)
 4. ピクセルサイズ
1. Tube voltage
 2. Focus size
 3. Source-Image Distance (SID)
 4. Pixel size

【問題21 回答1】

次のROC曲線でAzが大きいのはどれか？

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

1. a
2. b
3. c
4. d



【問題22 回答2】

画像圧縮に関する記述で誤りはどれか？

Which of the following statements on image compression is FALSE?

1. 可逆圧縮は、復元時にデータの劣化がない。
 2. 可逆圧縮の圧縮率は、概ね1/50程度である。
 3. 非可逆圧縮は、復元時に画像の劣化がみられる。
 4. 圧縮を行うと、保管や伝送時の取り扱いが有利となる。
1. Lossless compression does not degenerate in data when restoring it.
 2. Compression rate of lossless compression is generally about 1/50.
 3. Lossy compression shows deterioration in image when restoring it.
 4. Compression makes it handy when storing and transmitting it.

【問題23 回答1】

SI接頭辞として小さいものから並んでいるのはどれか？

Which of the following orders is arranged by ascending in SI prefixes?

1. キロ→メガ→ギガ→テラ

2. キロ→メガ→テラ→ギガ
3. キロ→ギガ→テラ→メガ
4. テラ→ギガ→メガ→キロ
1. kilo → mega → giga → tera
2. kilo → mega → tera → giga
3. kilo → giga → tera → mega
4. tera → giga → mega → kilo

【問題24 回答3】

以下の組み合わせで誤りはどれか？

Which of the following combinations is FALSE?

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

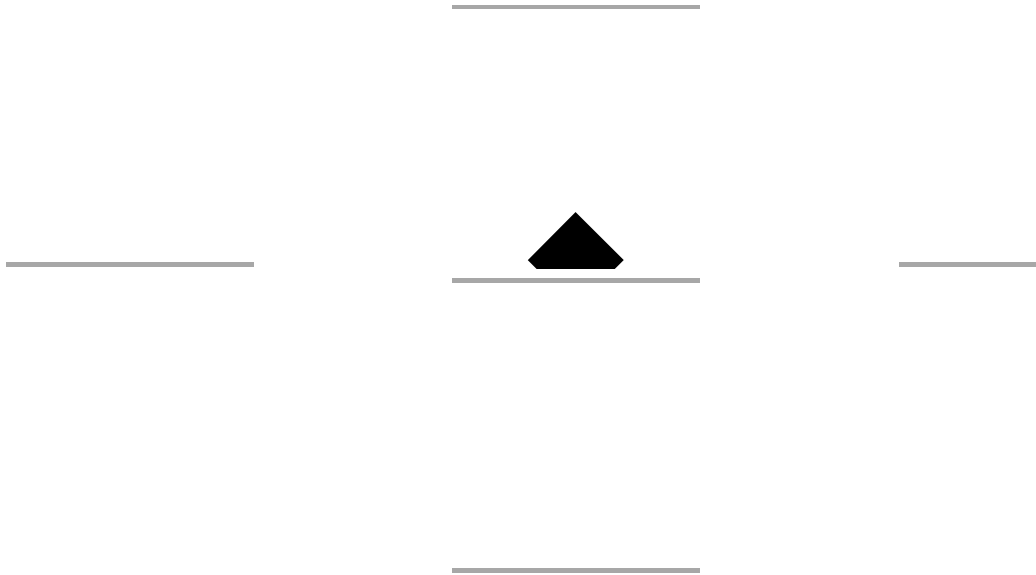
【問題25 回答2】

下図はコンピュータ内部のデータおよび制御の流れを示している。◆に入るのはどれか？

The diagram below indicates the internal flow of data and control in the computer. Which of the following goes into the box of ◆?

1. 記憶装置
2. 演算装置
3. 制御装置
4. 補助記憶装置
1. Memory
2. Arithmetic unit
3. Controller
4. Auxiliary storage

Central Processing Unit



Flow of data and control of five main devices

【問題26 回答1】

コンピュータの入力装置に分類されないものはどれか

Which of the following is NOT classified into an input device category?

1. メモリ
 2. バーコードリーダー
 3. OMR (Optical Mark Reader)
 4. スキャナ
1. Memory
 2. Bar-code reader
 3. OMR (Optical Mark Reader)
 4. Scanner

【問題27 回答4】

補助記憶装置に分類されないものはどれか

Which of the following is NOT categorized as auxiliary storages?

1. 磁気ディスク装置
 2. 光ディスク
 3. メモリカード
 4. キャッシュメモリ
1. Magnetic disc unit
 2. Optical disc
 3. Memory card
 4. Cache memory

【問題28 回答4】

オペレーティングシステムの役割でないのはどれか

Which of the following is NOT a function of an operating system?

1. ハードウェア資源の有効活用
 2. アプリケーションソフトウェア開発の負担軽減
 3. コンピュータの操作・運用の支援
 4. 電源の起動
1. Effective use of hardware resources
 2. Reduction of the burden of application software development
 3. Support of computer operation and management
 4. Power activation

【問題29 回答4】

①～⑥の中で、オペレーティングシステムの管理機能でないのはどれか

Consider the following management functions① - ⑥, which of following is NOT a function of the operating system?

- ①ジョブ管理・②タスク管理・③ファイル管理・④記憶管理・⑤仮想記憶管理・⑥入出力管理
- ① Job management ② Task management ③ File management ④ Memory management ⑤ Virtual memory management ⑥ Input-output management
1. ①④
 2. ②⑤
 3. ③⑥
 4. すべて管理機能に含まれる
4. All of the above

【問題30 回答3】

Which of the following is NOT correct about DICOM Standard?

- 1) PART 2: Conformance
- 2) PART 6: Data Dictionary
- 3) PART 9: Message Exchange
- 4) DICOM Part 14: Grayscale Standard Display Function

【問題31 回答4】

Which of the following is related to information for HIS and PACS?

- 1) ACQ Server
- 2) DB Server
- 3) FT Server
- 4) Broker

【問題32 回答3】

DICOM with communication protocol is?

- 1) IPX
- 2) STP
- 3) TCP/IP
- 4) NetBEUI

【問題33 回答2】

When new equipment is interfaced to PACS, which information is NOT required?

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

【問題34 回答3】

What is the basic unit of DICOM?

- 1) DICOM Message Service Element
- 2) Service class User
- 3) Service Object Pair
- 4) Information Object Definition

【問題35 回答3】

Which of the following names is to be divided into each modality in PACS?

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

【問題36 回答4】

It expresses to DICOM header, what is matched with delivered information to PACS as a specific value?

- 1) UID
- 2) DIMSE
- 3) SOP
- 4) Accession number

【問題37 回答4】

DICOM通信のTransfer Syntaxに該当しないのはどれか？

Which of following is NOT Transfer Syntax for DICOM?

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

【問題38 回答2】

DICOM Data Elementの中で、省略される可能性があるのはどれか？

Which of the following data elements in DICOM may be not used?

1. Tag
2. ValueRepresentation
3. ValueLength
4. Value Field

【問題39 回答4】

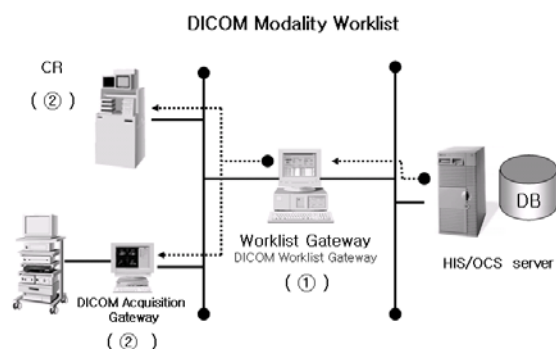
Conformance Statement (適合宣言書)に関して、誤りはどれか？

Consider Conformance Statement, Which of the following is FALSE?

1. DICOM対応機器は必ず策定する。
 2. 装置ごとに策定する。
 3. DICOM規格のどのサービスに対応しているかがわかる。
 4. 提出を要求されても、必ずしも提示する義務はない。
1. Besure of drawing up DICOM-enabled devices
 2. Draw up with each device
 3. Be able to understand which service in DICOM is corresponded to
 4. Be not obligated to provide even being required to state.

【問題40 回答3】

This is a diagram of DICOM Modality Work list. Fill the blanks!



- 1) ① DICOM Work list SCP ② DICOM Work list SCP
- 2) ① DICOM Work list SCU ② DICOM Work list SCU
- 3) ① DICOM Work list SCP ② DICOM Work list SCU
- 4) ① DICOM Work list SCU ② DICOM Work list SCP

【問題41 回答4】

IHEで用いる用語について誤りはどれか？

Which of the following is FALSE regarding a term used in IHE?

1. 統合プロファイルとは、業務シナリオのことで一般的なワークフローを意味する
 2. テクニカルワークフレームとは、システム連携のための標準規格の使い方を示したガイドラインを意味する。
 3. アクタとは、撮影装置や画像サーバ、画像表示装置などが該当する。
 4. トランザクションとは、テクニカルワークフレームを実装したシステムの接続試験を意味する
1. An integration profile means an operation scenario describing a general workflow.
 2. A technical framework means a guideline showing how to use standards of measure for system integration.
 3. Actors are imaging machines, video servers, and graphic display devices.
 4. A transaction means connection testing for systems implemented technical frameworks.

【問題42 回答1】

IHEで用いる用語の中で、「上位システムで修正した患者情報が自動的に下位システムにも反映されるシステム連携」に最も関連するものはどれか？

Which of the following best describes the term of system cooperation used in IHE that revised patient information in a superior system is automatically reconciled in the subordinate system?

1. PIR
2. SWF
3. IRWF
4. XDS

【問題43 回答3】

DICOMデータ構造のデータエレメントの構造において、グループ番号、エレメント番号の記載形式として正しいものはどれか？

Consider the structure of data elements in DICOM, Which of the following is TRUE to be represented as a group number and an element number?

- (グループ番号, エレメント番号)
(group number, element number)
1. (00008, 0001)
 2. (001, 001)
 3. (7FE0, 0001)
 4. (00Z5, 0001)

【問題44 回答4】

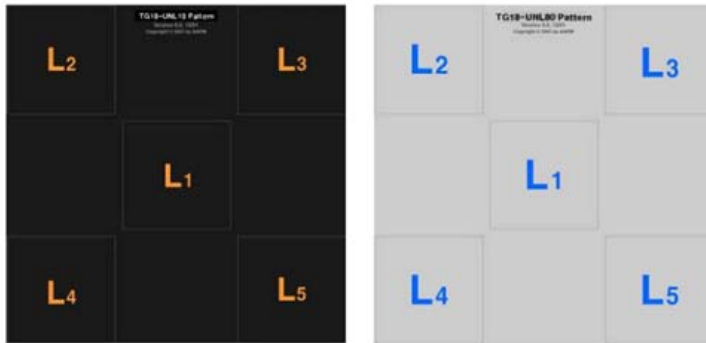
When the pixel size of diagnostic monitor is 5 Mega, what is the resolution?

- 1) 1024 X 4960

- 2) 1200 X 4096
- 3) 1600 X 3072
- 4) 2048 X 2560

【問題45 回答1】

This is a monitor performance test. What is indicated from L1 to L5 by assessment?



- 1) Luminance uniformity
- 2) Accumulated time of use
- 3) Geometric distortion
- 4) Gradient changes

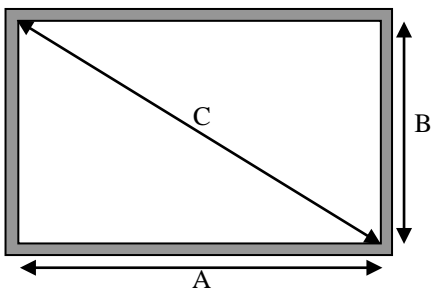
【問題46 回答3】

Which of the following is NOT the evaluation list for the monitor test using SMPTE test pattern?

- 1) 50% APL pattern
- 2) Cross pass pattern
- 3) Noise pattern
- 4) Gray scale

【問題47 回答1】

Which of the following is the monitor size?



- 1) Length of C
- 2) Length of A x B
- 3) Length of A + B

4) Length of A + B + C

【問題48 回答2】

What is a unit of brightness for monitor?

- 1) lx/m²
- 2) cd/m²
- 3) om/m²
- 4) Gx/m

【問題49 回答2】

画面アスペクト比が5:4に該当するものはどれか？

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

1. XGA
2. SXGA
3. UXGA
4. QXGA

【問題50 回答4】

下図はカラー液晶ディスプレイの構造を示している。図中のBに該当するものはどれか？

The diagram below shows a structure of the color liquid crystal display, what would go into the Bs in the diagram?



1. 液晶
 2. カラーフィルタ
 3. 透明電極
 4. 配向膜
1. Liquid crystal
 2. Color filter
 3. Transparent electrode
 4. Oriented film

【問題51 回答4】

グレアパネルと比較してアンチグレアパネルの特徴に関する記述について誤りはどれか？

Compared with a glare display, which of the following descriptions is FALSE about a characteristic of an anti-glare display?

1. 映り込みが少ない
 2. 鮮鋭度が悪い
 3. 粒状度が悪い
 4. コントラストが高い
1. Less reflection off the subject surface
 2. Poor sharpness
 3. Poor granularity
 4. High contrast

【問題52 回答3】

GSDFに関する記述で()に入る言葉を選べ

Regarding a statement on GSDF, fill in the provided blank with a word shown below.

低輝度から高輝度まで、()が等しく得られる

From low-luminance to high-luminance, () is uniformly acquired

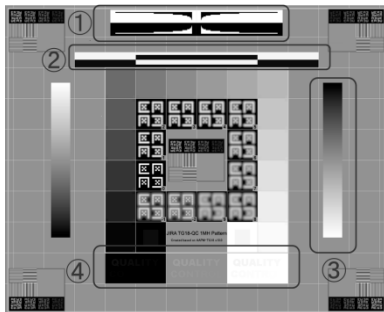
1. JND Index
2. 最大輝度
3. コントラスト分解能
4. Bartenカーブ

1. JND Index
2. Maximum luminance
3. Contrast resolution
4. Barten curve

【問題53 回答1】

クロストークを判断するパターンは①~④のうちどれか？

Which of the following elements ①-④ in the diagram below would be used for crosstalk judgment?



1. ①
2. ②
3. ③
4. ④

【問題54 回答1】

下記テストパターンの名称はどれか？

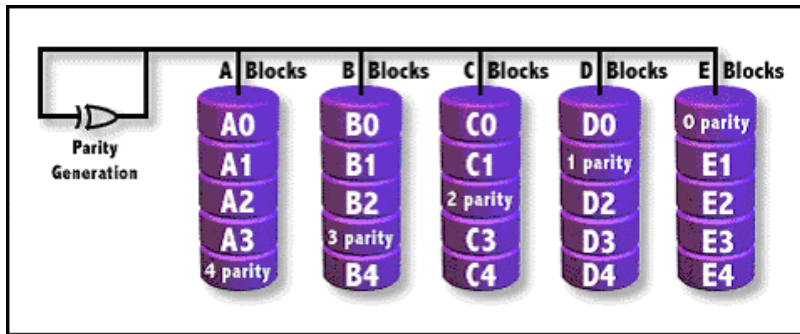
Which of the following patterns is the name of the test pattern below?



1. TG18-LN
2. TG18-UNL80
3. TG18-BN
4. TG18-CX

【問題55 回答4】

What is this diagram showing?



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

【問題56 回答2】

RAIDディスクが稼動中であっても障害のあるディスクを交換できる機能はどれか？
Which of the following functions allows you to replace a faulty disk while the RAID disk is running?

1. ミラーリング
2. ホットスワップ
3. ストライピング
4. プラグ&プレイ

1. Mirroring
2. Hot swap
3. Striping
4. Plug and play

【問題57 回答1】

Which of the following is true about Network layer of OSI?

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

【問題58 回答3】

OSI参照モデルで誤りはどれか？

Which of the following is FALSE describing that the OSI referencemodel is:

1. 異なるOSのコンピュータ間で通信できるように設計されている。
 2. 異なる通信媒体間で、通信できるように設計されている。
 3. コンピュータや通信機器が持つべき機能として、8層に分割されている。
 4. 国際標準化機構(ISO)で制定された国際規格である。
1. designed to be able to communicate between computers equipped with a different operation system.
 2. designed to be able to communicate between different communication media.
 3. divided into eight layers as a function that computers and communication devices should have.
 4. international specification established by ISO (International Standard).

【問題59 回答2】

What kind of terminology is connected to network from host?

- 1) telnet
- 2) ping
- 3) ttp
- 4) ipconfig

【問題60 回答4】

Which of the following is NOT included Hub?

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

【問題61 回答2】

It works a public network by internet lik a private network. What is this?

- 1) WAN
- 2) VPN
- 3) ASP
- 4) ISP

【問題62 回答4】

ネットワークに関する記載で、誤りはどれか？

Which of following statements regarding networks is FALSE?

1. ネットワークを構成する一つ一つの要素(通信機器)をノードという。
 2. ハブ、ルータなどはノードに該当する。
 3. ノードとノードを結ぶ線をリンクという。
 4. 無線ネットワークの場合はノードが存在しない。
1. A node is every single element (communication device) which consists of a network.
 2. A node is a hub or router.
 3. A connection line between nodes is called a link.
 4. A node does not exist in a wireless network.

【問題63 回答3】

IPアドレスに関しての記述で、誤りはどれか？

Which of the following statementson an IP address is FALSE?

1. コンピュータや通信機器1台1台に割り振られた32ビットの識別番号である。
 2. 8bit毎にピリオドで区切られる。
 3. コンピュータ名が違えばネットワーク内に同じアドレスが重複してもかまわない。
 4. 計算上42億9496万7296種類存在する。
1. It is an identificationnumberof 32 bits assigned to each computer orcommunication device.
 2. It is separated by dots between each group of eight bits.
 3. It is allowed to be overlapped in a network if the name of a computer isdifferent.
 4. 4,294,967,296 IP addresses are present based on the calculation.

【問題64 回答4】

IPアドレスに関して、誤りはどれか？

Which of the following is FALSE regarding an IP address?

1. IPアドレスは、ネットワークアドレスとホストアドレスからなる。

2. ネットワークアドレスは、IPアドレスとサブネットマスクから求めることができる。
3. ネットワークアドレスに使用するbit数によって、クラスA・クラス B・クラス Cに分類される。
4. ホストアドレスに使用するbit数と通信速度は、反比例の関係にある。

1. An IP address is made up of a network address and a host address.
2. A network address can be found from an IP address and a subnet mask.
3. Its class is determined by the number of bits used in a network address and classified into Class A, Class B, and Class C.
4. The number of bits used in a host address and its communication speed have an inverse relationship.

【問題65 回答4】

MACアドレスについて誤りはどれか？

Which of the following is FALSE that a MAC address is:

1. コンピュータに実装されているネットワークカードに付けられたユニークな番号である。
 2. 48bitの長さのアドレスである。
 3. 前半のアドレスはメーカー番号を表す
 4. 後半のアドレスは薬事承認番号を表す。
1. a unique identifier assigned to a network card stored in the computer.
 2. a 48-bit long address.
 3. assigned by a manufacturer and the manufacture number is shown in the first half of the address.
 4. assigned by a pharmaceutical approval and the pharmaceutical approval number is shown in the last half of the address.

【問題66 回答4】

以下の説明で誤っているものはどれか？

Which of the following statements is FALSE?

1. コネクション型通信は、信頼性の高い通信が可能である。
 2. コネクション型通信は、コネクション確立まで手間と時間を必要とする。
 3. コネクションレス型通信は、リアルタイム通信に向いている。
 4. コネクションレス型通信は、コネクション確立を瞬時に行う。
1. Connection-oriented communication is able to provide reliable network services.
 2. Connection-oriented communication needs some effort and time to set up a connection.
 3. Connectionless communication is suitable for real time communication.
 4. Connectionless communication instantly sets up a connection.

【問題67 回答2】

次のプロトコルと機能の組み合わせで誤っているのはどれか？

Which of the following is FALSE in a combination of a protocol and a function?

1. HTTP — Webブラウザによる表示
 2. FTP — メールへのファイル添付
 3. SMTP — メールの送信
 4. POP3 — メールの受信
1. HTTP-a display by Web browsers
 2. FTP-an attachment to a mail
 3. SMTP-mail delivery
 4. POP3-mail reception

【問題68 回答3】

pingコマンドの使用方法として、適切なものはどれか？

Which of the following is TRUE in a use of ping command?

1. ping [コンピュータ名]
 2. ping [MACアドレス]
 3. ping [IPアドレス]
 4. ping [ネットワークドメイン名]
1. ping (computer name)
 2. ping (MAC address)
 3. ping (IP address)
 4. ping (network domain name)

【問題69 回答4】

Firewall について誤っているのはどれか？

Which of the following regarding a firewall is FALSE?

1. 外部ネットワークとの境界を流れるデータを監視し、不正なアクセスを検出・遮断する。
 2. パケットフィルタ型は、パケットの宛先や送信元のIPアドレス、ポート番号などを監視して、その通信を受け入れるかどうかを制御する。
 3. サキットレベルゲートウェイ型は、自らに向けられていたIPアドレスとポート番号を振替、自らが外部と通信した結果を内部に返すという動作をする。
 4. アプリケーションゲートウェイ型は、物理層のレベルで外部との通信を代替し制御する。
1. A firewall monitors data passing through a border with external networks and detects and blocks unauthorized access.
 2. A packet filter monitors a destination packet address, a source IP address, and a port number then controls whether accepting the packet or not.
 3. A circuit-level gateway changes incoming IP addresses and port numbers and communicates with the external then sends the outcomes back to the internal.
 4. An application-level gateway replaces and controls communications with the external in the physical layer.

【問題70 回答1】

Which of the following is NOT a feature of Clustering?

- 1) Share with data ~~when~~ during an interruption of the power supply
- 2) Share with network IP Addresses and computer names
- 3) Share with DISK Array
- 4) Share with Application Software

【問題71 回答4】

コンピュータに関する記述で、誤りはどれか？

Which of the following statements on the computer is FALSE?

1. コンピュータが計算を行う場合、内部では2進数が用いられる。
 2. 電子回路の内部では電圧が低い状態と高い状態とで区分される。
 3. 電子回路の内部では電流が流れる状態と流れない状態とで区別される。
 4. 最小の情報単位をbitと呼び、1bitで8種類の情報を表すことができる。
1. When the computer is calculating, binary numbers are used in the inside of it.
 2. Voltage is divided into low levels and high levels in the electronic circuit.

3. Electric current is divided into flowing and not flowing in the electronic circuit.
4. A bit is the basic capacity of information and 1 bit is able to show eight types of information.

【問題72 回答2】

What is a basic unit for storing data from hard disk and fixing different sectors?

- 1) Track
- 2) Cluster
- 3) Cylinder
- 4) Field

【問題73 回答3】

This memory is used for supplement to different velocity CPU (Central Processing Unit) and main memory unit. What is this?

- 1) Operation memory
- 2) Virtual memory
- 3) Cache memory
- 4) Flash memory

【問題74 回答3】

Which of the following technique is shared with storage of Unix and Window System?

- 1) SAN
- 2) NAS
- 3) Smaba
- 4) RAID

【問題75 回答3】

Which of following is NOT imaging data?

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

【問題76 回答2】

What is directly connected to the images that are not interfered by computer and operation system anywhere access internet?

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

4) NT server

【問題77 回答3】

Which of the following conditions is NOT for a high quality 3-dimensional image?

- 1) Sufficient slice number
- 2) High matrix size
- 3) Wide z-axis resolution
- 4) Decrease of breath and move artifacts

【問題78 回答3】

Which of the following is the post processing technique that is fusion above two images?

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

【問題79 回答3】

使用している端末にウィルス感染が疑われるとき、最初にとる行動はどれか？

Which of the following actions will be the first one to take if the terminal in use is doubt of being virally-infected?

1. 端末の電源を切る
 2. システム管理者に連絡をとる
 3. ネットワークのケーブルを抜く
 4. データのバックアップをとる
1. Turn off the terminal.
 2. Contact with a system administrator.
 3. Unplug the network cable.
 4. Make backup data.

【問題80 回答2】

ネットワーク等を通じてほかのマシンに拡散することを目的とした不正プログラムで、強い増殖能力を示すウィルスの型はどれか？

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. トロイの木馬
 2. ワーム
 3. マクロ
 4. ミューテーション
1. Trojan horses
 2. Worms
 3. Macro
 4. Mutation

【問題81 回答4】

問題1. コンピュータウイルスの特徴ではないものはどれか

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

1. 自己伝染機能 2. 潜伏機能 3. 発病機能 4. 免疫生成機能

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

【問題82 回答2】

Which of the following modality is different Signal Profile?

1) CR

2) Direct DR

3) Indirect DR

4) CCD

【問題83 回答3】

Which of the following is different acquisition process?

1) Cerebroangiography

2) Brain CT diffusion

3) Transcranial Doppler

4) Dental Panorama

【問題84 回答1】

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

1) Shaded Surface Display

2) Volume Rendering Technique

3) Multi Planner Reformat

4) Virtual Endoscopy

【問題85 回答3】

様々なサービスをネットワーク経由で提供する側と提供される側に分かれるコンピュータの利用形態はどれか

Which of the following provides various services through a network between providers of a service and service requesters?

1. パッケージシステム

2. オンデマンドシステム

3. サーバ・クライアントシステム

4. カスタマーシステム

1. Package system

2. On demand system

3. Client-server system

4. Customer system

【問題86 回答2】

SSLに関して誤っているのはどれか？

Which of the following is FALSE describing that SSL

1. 情報を暗号化して送受信するプロトコルである。
 2. httpによりWebデータを暗号化して用いる
 3. 公開暗号鍵、デジタル証明書などセキュリティ技術を組み合わせている。
 4. データの盗聴や改ざん、なりすましを防ぐことができる。
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.

【問題87 回答2】

情報セキュリティの3要素に該当するものはどれか？

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

1. 安全性
 2. 完全性
 3. 保存性
 4. 真正性
1. Safety
 2. Integrity
 3. Storage
 4. Authenticity

【問題88 回答4】

情報のセキュリティを保つ方法に関する記述で誤りはどれか？

Consider the maintenance of information security, which of the following statements is FALSE?

1. 情報端末の操作は、認証された人だけに限定し、なりすまし防止の仕組みを用意する。
 2. 病院情報システムに、外部から不特定の人がアクセスできない仕組みを用意する。
 3. 端末が盗まれても、患者個人情報が読み出せない仕組みを用意する。
 4. 紙に手書きされた情報は、特に対策を取る必要はない。
1. Prepare for counter measures against spoofing by the way that the use of information terminals is exclusive to approved people.
 2. Prepare for a structure not to allow unspecified users from outside to access to hospital Information systems.
 3. Prepare for a system not to be able to get patient's personal information even though a terminal is stolen.
 4. It doesn't need to take special measures for the information written on a sheet of paper by hand.

【問題89 回答1】

以下の説明に当てはまるものはどれか？

「画像サーバの画像削除などのデータ変更に関する監査証跡のこと」

Which of the following describes an audit trail regarding data changes such as image deletion of an image server?

1. アクセスログ
 2. データ残容量チェック
 3. 公開鍵・秘密鍵
 4. システム仕様書
1. Access log
 2. Checking empty spaces for data
 3. Public key and Private key
 4. System specifications

【問題90 回答2】

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

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

4) Telephone