Name: Class:

24 2023 ,نوفمبر

Test

Please use a pencil to complete the test. Print your name on the Name line above. Read the instructions for each section carefully. When you have completed the test, place your test face down on your desk and raise your hand.

__ 1 1. sense of how they operate. We concentrate on GIF and JPG image file formats, since the GIF file format is one of the simplest and contains several fundamental features,

what are the two image file formats that the text concentrates on?

(A) PNG and BMP
(B) GIF and JPG
(C) TIFF and PSD
(D) SVG and ICO

__ 1 2. The number of file formats used in multimedia continues to proliferate [1]. For example, Table 3.1 shows a list of file formats used in the popular product Adobe Premiere. In this chapter, we shall study just a few popular file formats, to develop a sense of how they operate. We concentrate on GIF and JPG image file formats, since the GIF file format is one of the simplest and contains several fundamental features, and the JPG file format is arguably the most important overall.

To begin with, we discuss the features of file formats in general.

what is the name of the product that uses many different file formats in multimedia?

(A) Adobe Photoshop
(B) Adobe Premiere
(C) Adobe Illustrator
(D) Adobe Acrobat

__ 1 3. The number of file formats used in multimedia continues to proliferate [1]. For example, Table 3.1 shows a list of file formats used in the popular product Adobe Premiere. In this chapter, we shall study just a few popular file formats, to develop a sense of how they operate. We concentrate on GIF and JPG image file formats, since

what is the main purpose of studying the file formats?

(A) To develop a sense of how they operate
(B) To compare their advantages and disadvantages
(C) To learn how to create and edit them
(D) To understand their historical development

4. —/1

Images consist of *pixels*—picture elements in digital images. A 1-bit image consists of on and off bits only and thus is the simplest type of image. Each pixel is stored as

what is the name of the picture element in digital images?

(A) Pixel
(B) Voxel
(C) Texel
(D) Pixela

5. —/1

Images consist of *pixels*—picture elements in digital images. A 1-bit image consists of on and off bits only and thus is the simplest type of image. Each pixel is stored as a single bit (0 or 1). Hence, such an image is also referred to as a *binary image*.

It is also sometimes called a 1-bit *monochrome* image since it contains no color. Figure 3.1 shows a 1-bit monochrome image (called "Lena" by multimedia scientists—this is a standard image used to illustrate many algorithms). A 640×480 monochrome image requires 38.4 kilobytes (kB) of storage ($= 640 \times 480/8$). Monochrome 1-bit images can be satisfactory for pictures containing only simple graphics and text. Moreover, fax machines use 1-bit data, so in fact 1-bit images are still

what is the name of the standard image used to illustrate many algorithms by multimedia scientists?

(A) Mona
(B) Lisa
(C) Lena
(D) Anna

6. —/1

scientists—this is a standard image used to illustrate many algorithms). A 640×480 monochrome image requires 38.4 kilobytes (kB) of storage ($= 640 \times 480/8$). Monochrome 1-bit images can be satisfactory for pictures containing only simple graphics and text. Moreover, fax machines use 1-bit data, so in fact 1-bit images are still

what is the storage requirement for a 640×480 monochrome image in kilobytes (kB)?

(A) 19.2
(B) 38.4
(C) 76.8
(D) 153.6

__/1 7. We refer to such an array as a *bitmap*—a representation of the graphics/image data that parallels the manner in which it is stored in video memory.

what is the term used to describe the representation of the graphics/image data that parallels the manner in which it is stored in video memory?

(A) Bitmap (B) Pixelmap

(C) Framemap (D) Videomap

__/1 8. Such an array must be stored in hardware; we call this hardware a *frame buffer*. Special (relatively expensive) hardware called a "video" card (actually a graphics card) is used for this purpose. The resolution of the video card does not have to match the desired resolution of the image, but if not enough video card memory is available, the data have to be shifted around in RAM for display.

what is the name of the hardware that stores the image array for display?

(A) Frame buffer (B) Video card

(C) RAM (D) CPU

__/1 9.

Fig. 3.4 Dithering of grayscale images. **a** 8-bit gray image `lenagray.bmp`; **b** dithered version of the image; **c** detail of dithered version

what is the technique used to print an 8-bit image on a device that can only print a dot or not print it?

(A) Dithering (B) Halftoning

(C) Antialiasing (D) Interpolation

__/1 10.

The following sections introduce some of the most common data types for graphics and image file formats: 24-bit color and 8-bit color. We then discuss file formats. There are some formats that are restricted to particular hardware/operating system platforms (e.g., X-windows in Linux), while many others are *platform-independent*, or *cross-platform*, formats. Even if some formats are not cross-platform, conversion applications can recognize and translate formats from one system to another.

what is the term used to describe the image formats that can be used on different hardware/operating systems without any conversion?

(A) Platform-dependent
(B) Platform-independent
(C) Platform-specific
(D) Platform-generic

__/1 11.

In a color 24-bit image, each pixel is represented by three bytes, usually representing RGB. Since each value is in the range 0–255, this format supports $256 \times 256 \times 256$, or a total of 16,777,216, possible combined colors. However, such flexibility does result in a storage penalty: a 640×480 24-bit color image would require 921.6 kB of storage without any compression.

what is the name of the color model that uses three bytes to represent each pixel in a 24-bit color image?

(A) RGB
(B) CMYK
(C) HSV
(D) YUV

__/1 12.

An important point to note is that many 24-bit color images are actually stored as 32-bit images, with the extra byte of data for each pixel storing an α (*alpha*) value representing special-effect information. (See [2] for an introduction to use of the α-channel for compositing several overlapping objects in a graphics image. The simplest use is as a transparency flag).

what is the name of the extra byte of data that stores special-effect information for each pixel in a 32-bit image?

(A) Alpha
(B) Beta
(C) Gamma
(D) Delta

13. Figure 3.5 shows the image `forestfire.bmp`, a 24-bit image in Microsoft Windows BMP format (discussed later in the chapter). Also shown are the grayscale images for just the red, green, and blue channels, for this image. Taking the byte values 0..255 in each color channel to represent intensity, we can display a gray image for each color separately.

what is the name of the image format that is used for the 24-bit color image of forestfire.bmp?

(A) BMP (B) GIF
(C) JPG (D) PNG

14. **3.1.5 Higher Bit-Depth Images**

Among image formats that are usually *not* compressed if possible are ones that require maximum faithfulness to the viewed scene for various reasons such as medical liability. For example, an image of a patient's liver had better represent the colors red and purple, say, very accurately!

what is the main reason for using high bit-depth images in medical applications?

(A) To reduce the storage size of the images
(B) To represent the colors of the scene very accurately
(C) To enhance the contrast and brightness of the images
(D) To apply special effects and filters to the images

15. Other image formats recognize that more information about the scene being imaged can be gained by using special cameras that view more than just three colors, i.e., RGB. Here the idea might be to use invisible light (e.g., infrared, ultraviolet) for security cameras, say, or to produce medical images of skin that can utilize the additional colors to better diagnose skin ailments such as carcinoma. Another reason for using high bit-depth is in satellite imaging, where extra information can give

what is the name of the type of light that is invisible to human eyes but can be used for security or medical imaging?

(A) Infrared or ultraviolet (B) Gamma or X-ray
(C) Microwave or radio (D) Laser or LED

__ 1 16. indication of types of crop growth, etc.: here, the cost of simply lifting the camera into high altitude or into space motivates the idea of obtaining as much information as possible, perhaps even if we cannot as yet make use of all the data.

Such images are called *multispectral* (more than three colors) or hyperspectral (a great many image planes, say 224 colors for satellite imaging).

In this chapter we shall stick to grayscale or RGB color images.

what is the name of the images that have more than three colors, such as 224 colors for satellite imaging?

(A) Multispectral
(B) Hyperspectral
(C) Polyspectral
(D) Megaspectral

__ 1 17. Suppose all the colors in a 24-bit image were collected in a 256 × 256 × 256 set of cells, along with the count of how many pixels belong to each of these colors stored in that cell. For example, if exactly 23 pixels have RGB values (45, 200, 91) then store the value 23 in a three-dimensional array, at the element indexed by the index values [45, 200, 91]. This data structure is called a *color histogram* (see, e.g., [3,4]). It is a very useful tool for image transformation and manipulation in Image Processing.

what is the name of the data structure that stores the count of how many pixels belong to each color in a 24-bit image?

(A) Color histogram
(B) Color lookup table
(C) Color matrix
(D) Color array

__ 1 18. Basically, large populations in 3D histogram bins can be subjected to a split-and-merge algorithm to determine the "best" 256 colors. Figure 3.7 shows the resulting

what is the name of the algorithm that can be used to determine the best 256 colors from the 3D histogram bins?

(A) Split-and-merge
(B) Divide-and-conquer
(C) Merge-and-sort
(D) Cluster-and-select

__ 1 19.

3.1.7 Color Lookup Tables

Again, the idea used in 8-bit color images is to store only the index, or code value, for each pixel. Then, if a pixel stores, say, the value 25, the meaning is to go to row 25 in a color lookup table (LUT). While images are displayed as two-dimensional arrays of values, they are usually *stored* in row-column order as simply a long series of values. For an 8-bit image, the image file can store in the file header information just what 8-bit values for R, G, and B correspond to each index. Figure 3.8 displays this idea. The LUT is often called a *palette*.

what is the name of the table that stores the 24-bit color information for each index in an 8-bit color image?

(A) Color lookup table
(B) Color histogram
(C) Color matrix
(D) Color array

__ 1 20.

A simple animation process is possible via simply changing the color table: this is called *color cycling* or *palette animation*. Since updates from the color table are

what is the name of the simple animation process that is possible by changing the color table of an 8-bit color image?

(A) Color cycling
(B) Color shifting
(C) Color blending
(D) Color morphing

__ 1 21.

Some popular image file formats are described below. One of the simplest is the 8-bit GIF format, and we study it because it is easily understood, and also because of its historical connection to the WWW and HTML markup language as the first image type recognized by net browsers. However, currently the most important common

what is the name of the first image type recognized by net browsers that is connected to the WWW and HTML markup language?

(A) GIF
(B) JPEG
(C) PNG
(D) BMP

__ 1 22. The *actual raster data* itself is first compressed using the LZW compression scheme (see Chap. 7) before being stored.

The GIF87 standard also set out, for future use, how Extension Blocks could be defined. Even in GIF87, simple animations can be achieved, but no delay was defined between images, and multiple images simply overwrite each other with no screen clears.

what is the name of the compression scheme that is used to compress the raster data in GIF87 format?

(A) LZW
(B) LZ77
(C) Huffman
(D) RLE

__ 1 23. It is worthwhile examining the file format for GIF87 in more detail, since many such formats bear a resemblance to it but have grown a good deal more complex than this "simple" standard. For the standard specification, the general file format is as in Fig. 3.12. The *Signature* is six bytes: `GIF87a`; the *Screen Descriptor* is a seven-byte set of flags. A GIF87 file can contain more than one image definition, usually to fit on several different parts of the screen. Therefore each image can contain its own

what is the name of the six-byte signature that identifies the GIF87 file format?

(A) GIF87a
(B) GIF87b
(C) GIF87c
(D) GIF87d

__ 1 24.

Each image in the file has its own Image Descriptor, defined as in Fig. 3.15. Interestingly, the developers of this standard allowed for future extensions by ignoring any bytes between the end of one image and the beginning of the next, identified by a comma character. In this way, future enhancements could have been simply inserted in a backward-compatible fashion.

If the *interlace* bit is set in the local Image Descriptor, the rows of the image are displayed in a four-pass sequence, as in Fig. 3.16. Here, the first pass displays rows 0 and 8, the second pass displays rows 4 and 12, and so on. This allows for a quick sketch to appear when a web browser displays the image, followed by more detailed fill-ins. The JPEG standard (below) has a similar display mode, denoted *progressive mode*.

The *actual raster data* itself is first compressed using the LZW compression scheme (see Chap. 7) before being stored.

The GIF87 standard also set out, for future use, how Extension Blocks could be defined. Even in GIF87, simple animations can be achieved, but no delay was defined between images, and multiple images simply overwrite each other with no screen clears.

what is the character that identifies the beginning of the next image in a GIF87 file format?

(A) Comma
(B) Semicolon
(C) Colon
(D) Period

__ 1 25.

quick sketch to appear when a web browser displays the image, followed by more detailed fill-ins. The JPEG standard (below) has a similar display mode, denoted *progressive mode*.

what is the name of the feature that allows for a quick sketch to appear when a web browser displays the image, followed by more detailed fill-ins, in both GIF and JPEG formats?

(A) Interlacing
(B) Progressive
(C) Scanline
(D) Streaming

__ 26.
1

3.2.2 JPEG

The most important current standard for image compression is JPEG [6]. This standard was created by a working group of the International Organization for Standardization (ISO) that was informally called the Joint Photographic Experts Group and is therefore so named. We shall study JPEG in greater detail in Chap. 9, but a few

what is the name of the working group that created the JPEG standard?

(A) Joint Photographic Experts Group
(B) Joint Picture Encoding Group
(C) Joint Pixel Enhancement Group
(D) Joint Pattern Extraction Group

__ 27.
1

extremely fine detail. If many changes occur within a few pixels, we refer to that image segment as having *high spatial frequency*—that is, a great deal of change

What is the term used to describe the image segment that has many changes within a few pixels?

(A) High spatial frequency
(B) High temporal frequency
(C) Low spatial frequency
(D) Low temporal frequency

__ 28.
1

grayscale (black and white). Therefore, color information in JPEG is *decimated* (partially dropped, or averaged) and then small blocks of an image are represented in the spatial frequency domain (u, v), rather than in (x, y). That is, the speed of changes

What is the name of the domain where JPEG represents small blocks of an image by measuring the speed of changes in pixel values?

(A) phase domain
(B) Spatial Frequency domain
(C) Time domain
(D) Color domain

29. — / 1

3.2.3 PNG

One interesting development stemming from the popularity of the Internet is efforts toward more system-independent image formats. One such format is *Portable Network Graphics* (PNG).This standard is meant to supersede the GIF standard and extends it in important ways. The motivation for a new standard was in part the patent held by UNISYS and Compuserve on the LZW compression method. (Interestingly, the patent covers only compression, not decompression: this is why the Unix `gunzip` utility can decompress LZW-compressed files).

Special features of PNG files include support for up to 16 bits per pixel in each color channel, i.e., 48-bit color—a large increase. Files may also contain gamma-correction

What is the main reason for creating the PNG standard?

(A) To avoid the patent issues of the LZW compression method used by GIF

(B) To support more system-independent image formats for the Internet

(C) To increase the color depth and gamma-correction features of the images

(D) All of the above

30. — / 1

Special features of PNG files include support for up to 16 bits per pixel in each color channel, i.e., 48-bit color—a large increase. Files may also contain gamma-correction

what is the maximum number of bits per pixel that PNG can support in each color channel?

(A) 8

(B) 16

(C) 24

(D) 32

31. — / 1

Tagged Image File Format (TIFF) is another popular image file format. Developed by the Aldus Corporation in the 1980s, it was later supported by Microsoft. Its support

what is the name of the company that developed the TIFF standard?

(A) Adobe

(B) Aldus

(C) Apple

(D) Autodesk

32. 1

3.2.4 TIFF

Tagged Image File Format (TIFF) is another popular image file format. Developed by the Aldus Corporation in the 1980s, it was later supported by Microsoft. Its support for attachment of additional information (referred to as "tags") provides a great deal of flexibility. The most important tag is a format signifier: what type of compression, etc., is in use in the stored image. For example, TIFF can store many different types of images: 1-bit, grayscale, 8-bit, 24-bit RGB, and so on. TIFF was originally a lossless

what is the name of the additional information that TIFF files can attach to each section?

(A) Tags
(B) Headers
(C) Metadata
(D) Attributes

33. 1

Note, however, that the PostScript page description language does not provide compression; in fact, PostScript files are just stored as ASCII. Therefore files are often large, and in academic settings, it is common for such files to be made available only after compression by some Unix utility, such as `compress` or `gzip`.

Therefore, another text + figures language has largely superseded PostScript in non-academic settings: Adobe Systems Inc. includes LZW (see Chap. 7) compression in its *Portable Document Format* (PDF) file format. As a consequence, PDF files that do not include images have about the same compression ratio, 2:1 or 3:1, as do files compressed with other LZW-based compression tools, such as the Unix

What is the main difference between PostScript and PDF in terms of compression?

(A) PostScript uses LZW compression while PDF uses JPEG compression
(B) PostScript does not provide compression while PDF uses LZW and JPEG compression
(C) PostScript uses ASCII encoding while PDF uses binary encoding
(D) PostScript uses vector-based graphics while PDF uses pixel-based graphics

34. 1

Therefore, another text + figures language has largely superseded PostScript in non-academic settings: Adobe Systems Inc. includes LZW (see Chap. 7) compression in its *Portable Document Format* (PDF) file format. As a consequence, PDF files that do not include images have about the same compression ratio, 2:1 or 3:1, as do files compressed with other LZW-based compression tools, such as the Unix `compress` or `gzip`, or the PC-based `winzip` (a variety of `pkzip`) or WinRAR.

what is the name of the compression method that PDF uses for text and figures?

(A) LZW
(B) JPEG
(C) JBIG
(D) ZIP

__ 1 35. a PostScript interpreter built into them. PostScript is a vector-based, rather than pixel-based, picture language: page elements are essentially defined in terms of vectors. With fonts defined this way, PostScript includes vector/structured graphics as well as text; bit-mapped images can also be included in output files. Encapsulated PostScript

What is the main advantage of PostScript as a picture language?

(A) It can include bit-mapped images in output files.
(B) It can define fonts and graphics in terms of vectors.
(C) It can run on high-end printers with a built-in interpreter.
(D) It can produce pixel-based, rather than vector-based, pictures.

__ 1 36. name Postscript arose because its language is based on the stack data structure, with *postfix* notation, where an operator follows its operands. The *stroke-based* graphics

what is the name of the data structure that PostScript is based on, where an operator follows its operands?

(A) Stack
(B) Queue
(C) List
(D) Tree

__ 1 37.

3.2.5 Windows BMP

BitMap (BMP) is one major system standard image file format for Microsoft Windows. It uses raster graphics. BMP supports many pixel formats, including indexed color (up to 8 bits per pixel), and 16, 24, and 32-bit color images. It makes use of Run-Length Encoding (RLE) compression (see Chap. 7) and can fairly efficiently compress 24-bit color images due to its 24-bit RLE algorithm. BMP images can also be stored uncompressed. In particular, the 16-bit and 32-bit color images (with α-channel information) are always uncompressed.

what is the name of the system standard image file format for Microsoft Windows that uses raster graphics and supports many pixel formats?

(A) Windows BMP
(B) Windows WMF
(C) Windows PNG
(D) Windows JPEG

__ 1 38.

3.2.6 Windows WMF

Windows MetaFile (WMF) is the native vector file format for the Microsoft Windows operating environment. WMF files actually consist of a collection of *Graphics Device Interface* (GDI) function calls, also native to the Windows environment. When a WMF file is "played" (typically using the Windows `PlayMetaFile()` function) the described graphic is rendered. WMF files are ostensibly device-independent and unlimited in size. The later Enhanced Metafile Format Plus Extensions (EMF+) format is device independent.

what is the name of the native vector file format for the Microsoft Windows operating environment that consists of a collection of Graphics Device Interface function calls?

(A) Windows BMP
(B) Windows WMF
(C) Windows PNG
(D) Windows JPEG

__ 1 39.

Graphics Interchange Format (GIF) was devised by UNISYS Corporation and Compuserve, initially for transmitting graphical images over phone lines via modems. The GIF standard uses the Lempel-Ziv-Welch algorithm (a form of compression—see Chap. 7), modified slightly for image scanline packets to use the line grouping of

GIF stands for

A. ____ Graphic Interconnection File
B. ____ Graphical Interface Format
C. ____ Graphic Information Format
D. ✓ Graphic Interchange Format

Notes: https://meritnotes.com/computer-quiz/multimedia-pdf/2-635/

__ 1 40. *Graphics Interchange Format* (GIF) was devised by UNISYS Corporation and Compuserve, initially for transmitting graphical images over phone lines via modems. The GIF standard uses the Lempel-Ziv-Welch algorithm (a form of compression—see Chap. 7), modified slightly for image scanline packets to use the line grouping of pixels effectively.

The GIF standard is limited to 8-bit (256) color images only. While this produces acceptable color, it is best suited for images with few distinctive colors (e.g., graphics or drawing).

Which among following is an image name extension?

A. ✓ gif

B. ____ docx

C. ____ ppt

D. ____ lib

Notes: https://www.atnyla.com/general-knowledge/89/192

__ 1 41. *Graphics Interchange Format* (GIF) was devised by UNISYS Corporation and Compuserve, initially for transmitting graphical images over phone lines via modems. The GIF standard uses the Lempel-Ziv-Welch algorithm (a form of compression—see Chap. 7), modified slightly for image scanline packets to use the line grouping of pixels effectively.

The GIF standard is limited to 8-bit (256) color images only. While this produces acceptable color, it is best suited for images with few distinctive colors (e.g., graphics or drawing).

gif is an extension of?

A. ✓ Image file

B. ____ Video file

C. ____ Audio file

D. ____ Word file

Notes: https://www.wedugo.com/question/a61d3d9d7a2222/gif-is-an-extension-of.html

__ 42.
1

Tagged Image File Format (TIFF) is another popular image file format. Developed by the Aldus Corporation in the 1980s, it was later supported by Microsoft. Its support for attachment of additional information (referred to as "tags") provides a great deal

TIFF stands for

A. ✓ tagged image file format

B. ____ tagged internet file format

C. ____ tagged integrated file forma

D. ____ tagged interchange file format

Notes: https://mcqmate.com/topic/415/fundamentals-of-multimedia

__ 43.
1

Since we effectively throw away a lot of information by the division and truncation step, this compression scheme is "lossy" (although a lossless mode exists). What is more, since it is straightforward to allow the user to choose how large a denominator to use and hence how much information to discard, JPEG allows the user to set a desired level of quality, or compression ratio (input divided by output).

The _____ image files are lossy format.

A. ✓ JPEG

B. ____ JPG

C. ____ BMP

D. ____ GIF

Notes: https://meritnotes.com/computer-quiz/multimedia-mcq/2-76929/

__ 1 44. Since we effectively throw away a lot of information by the division and truncation step, this compression scheme is "lossy" (although a lossless mode exists). What is more, since it is straightforward to allow the user to choose how large a denominator to use and hence how much information to discard, JPEG allows the user to set a desired level of quality, or compression ratio (input divided by output).

In JPEG, the two categories of image file compression are ____ and _____

A. ____ lossy, static

B. ✓ lossy, lossless

C. ____ digital, image

D. ____ static, image

Notes: https://meritnotes.com/computer-quiz/multimedia-online-quiz/2-77977/

__ 1 45. In fact, GIF comes in two flavors. The original specification is GIF87a. The later version, GIF89a, supports simple *animation* via a Graphics Control Extension block in the data. This provides simple control over *delay time*, a *transparency index*, and so on. Software such as Corel Draw allows access to and editing of GIF images.

Which file format is excellent for animation?

A. ____ Tiff

B. ✓ Gif

C. ____ Jpeg

D. ____ Png

Notes: https://www.proprofs.com/quiz-school/story.php?title=jpeg-tif-gif-png

__ 1 46. One interesting development stemming from the popularity of the Internet is efforts toward more system-independent image formats. One such format is *Portable Network Graphics* (PNG).This standard is meant to supersede the GIF standard and

png is a file extension.PNG satnd for

A. ____ picture navigation graph

B. ✓ portable network graphics

C. ____ picture network graphics

D. ____ portable navigation graphs

Notes: https://atozexam.com/png-is-a-file-extension-png-stands-for-_____/

47. **3.1.1 1-Bit Images** — 1

Images consist of *pixels*—picture elements in digital images. A 1-bit image consists of on and off bits only and thus is the simplest type of image. Each pixel is stored as a single bit (0 or 1). Hence, such an image is also referred to as a *binary image*.

When we have a 'one-bit' colour, which are the only two binary numbers that are possibilities?

(A) 00 and 11
(B) 000 and 111
(C) 0 and 1
(D) 0000 and 1111

Notes: https://quizizz.com/admin/quiz/5cc9660c0e7eaa001a4eb7ef/binary-image-representation?ctaSource=show-answers&fromPage=admin-quizType-id-slug

48. **3.1.1 1-Bit Images** — 1

Images consist of *pixels*—picture elements in digital images.

Fill in the blank to complete the sentence) Tiny squares called ..... are the building blocks of all digital images.

(A) elements
(B) squares
(C) pixars
(D) pixels

Notes: https://quizizz.com/admin/quiz/5cc9660c0e7eaa001a4eb7ef/binary-image-representation?ctaSource=show-answers&fromPage=admin-quizType-id-slug

49. **3.1.2 8-Bit Gray-Level Images** — 1

Now consider an 8-bit image—that is, one for which each pixel has a *gray value* between 0 and 255. Each pixel is represented by a single byte—for example, a dark pixel might have a value of 10, and a bright one might be 230.

How many different values can be picked by gray scale image ?

(A) 2
(B) 125
(C) 126
(D) 256

Notes: https://engineeringinterviewquestions.com/mcqs-on-gray-scale-vs-binary-imaging-and-answers/

__ 50. **3.1.2 8-Bit Gray-Level Images**

1

Now consider an 8-bit image—that is, one for which each pixel has a *gray value* between 0 and 255. Each pixel is represented by a single byte—for example, a dark pixel might have a value of 10, and a bright one might be 230.

Grey color of image lies between ____ colors?

(A) White and black
(B) White and red
(C) Black and red
(D) Black and green

Notes: https://www.watelectronics.com/mcq/digital-image-processing/

__ 51. **3.1.1 1-Bit Images**

1

Images consist of *pixels*—picture elements in digital images. A 1-bit image consists of on and off bits only and thus is the simplest type of image. Each pixel is stored as a single bit (0 or 1). Hence, such an image is also referred to as a *binary image*.

Which of the following type of digital image processing performs image processing using 0 or 1 digit?

(A) Binary images
(B) Color images
(C) Multispectral images
(D) Gray-scale images

Notes: https://www.watelectronics.com/mcq/digital-image-processing/

__ 52. **3.1.2 8-Bit Gray-Level Images**

1

Now consider an 8-bit image—that is, one for which each pixel has a *gray value*

How many bits/pixel does a grey scale image comprises of with 256 different gray level?

(A) 8
(B) 4
(C) 12
(D) 16

__ 1 53. **3.1.4 24-Bit Color Images**

In a color 24-bit image, each pixel is represented by three bytes, usually representing RGB. Since each value is in the range 0–255, this format supports 256 × 256 × 256, or a total of 16,777,216, possible combined colors. However, such flexibility does result in a storage penalty: a 640 × 480 24-bit color image would require 921.6 kB of storage without any compression.

A RGB images comprises of _ number of bits/pixels for 8-bit monochrome?

(A) 24 (B) 16

(C) 12 (D) 8

Notes: https://www.watelectronics.com/mcq/digital-image-processing/

__ 1 54. **3.1.4 24-Bit Color Images**

In a color 24-bit image, each pixel is represented by three bytes, usually representing RGB. Since each value is in the range 0–255, this format supports 256 × 256 × 256, or a total of 16,777,216, possible combined colors. However, such flexibility does result in a storage penalty: a 640 × 480 24-bit color image would require 921.6 kB of storage without any compression.

How many bit RGB color image is represented by full-color image ?

(A) 32-bit RGB color image (B) 24-bit RGB color image

(C) 16-bit RGB color image (D) 8-bit RGB color image

Notes: https://www.sanfoundry.com/digital-image-processing-questions-answers-color-models-2/

__ 1 55. The entire image can be thought of as a two-dimensional array of pixel values. We refer to such an array as a *bitmap*—a representation of the graphics/image data that parallels the manner in which it is stored in video memory.

How graphics are represented by the computer?

(A) Binary (B) Bitmap

(C) ASCII (D) Unicode

Notes: https://www.proprofs.com/quiz-school/story.php?title=data-representation

__ 1 56. the GIF file format is one of the simplest and contains several fundamental features, and the JPG file format is arguably the most important overall.
To begin with, we discuss the features of file formats in general.

Image is stored in ____ format?

(A) JPEG (B) exe
(C) doc (D) ppt

Notes: https://www.watelectronics.com/mcq/digital-image-processing/

__ 1 57. The entire image can be thought of as a two-dimensional array of pixel values. We refer to such an array as a *bitmap*—a representation of the graphics/image data

Bitmap is a collection of ____ that describes an image.

(A) pixels (B) algorithms
(C) bits (D) colors

Notes: https://www.sanfoundry.com/1000-computer-graphics-questions-answers/

__ 1 58. *Image resolution* refers to the number of pixels in a digital image (higher resolution always yields better quality). Fairly high resolution for such an image might be 1,600 × 1,200, whereas lower resolution might be 640 × 480. Notice that here we are using an *aspect ratio* of 4:3. We do not have to adopt this ratio, but it has been

Quality of an image depends on:

(A) Resolution (B) Metadata
(C) Screen size (D) Computer's speed

Notes: https://quizizz.com/admin/quiz/5c3df29ef275d3001addd038/data-representation-images

__ 1 59. *Image resolution* refers to the number of pixels in a digital image

The density of pixels in an image file is known as:

(A) Resolution (B) Dimensions
(C) Transparency (D) Compression

Notes: https://quizizz.com/admin/quiz/5c3df29ef275d3001addd038/data-representation-images

__ 1 60. The entire image can be thought of as a two-dimensional array of pixel values.

Pixel can be arranged in a regular

(A) One dimensional grid (B) two dimensional grid

(C) Three dimensional grid (D) None of these

Notes: https://www.engineeringmcq.com/computer-science/computer-graphics/15.php

__ 1 61. *Graphics Interchange Format* (GIF) was devised by UNISYS Corporation and Compuserve, initially for transmitting graphical images over phone lines via modems. The GIF standard uses the Lempel-Ziv-Welch algorithm (a form of compression—see Chap. 7), modified slightly for image scanline packets to use the line grouping of pixels effectively.

What is the primary purpose of the Lempel-Ziv-Welch algorithm in the GIF standard?

A. ____ Color correction

B. ____ Image encryption

C. ✓ Data compression

D. ____ mage rendering

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 62. The GIF standard is limited to 8-bit (256) color images only. While this produces acceptable color, it is best suited for images with few distinctive colors (e.g., graphics or drawing).

What is the color limitation of the GIF standard?

A. ____ 16-bit color

B. ____ 32-bit color

C. ____ 64-bit color

D. ✓ 8-bit color

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 63. In fact, GIF comes in two flavors. The original specification is GIF87a. The later version, GIF89a, supports simple *animation* via a Graphics Control Extension block in the data. This provides simple control over *delay time*, a *transparency index*, and so on. Software such as Corel Draw allows access to and editing of GIF images.

Which version of the GIF standard supports simple animation?

A. ____ GIF86a

B. ____ GIF88a

C. ✓ GIF89a

D. ____ GIF90a

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 64. *Graphics Interchange Format* (GIF) was devised by UNISYS Corporation and Compuserve, initially for transmitting graphical images over phone lines via modems. The GIF standard uses the Lempel-Ziv-Welch algorithm (a form of compression—see Chap. 7), modified slightly for image scanline packets to use the line grouping of pixels effectively.

Who devised the Graphics Interchange Format (GIF)?

A. ____ Adobe Corporation

B. ____ Microsoft Corporation

C. ✓ UNISYS Corporation and CompuServe

D. ____ IBM Corporation

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 65. In fact, GIF comes in two flavors. The original specification is GIF87a. The later version, GIF89a, supports simple *animation* via a Graphics Control Extension block in the data. This provides simple control over *delay time*, a *transparency index*, and so on. Software such as Corel Draw allows access to and editing of GIF images.

What feature does GIF89a introduce for animation control?

A. ____ Hue adjustment

B. ✓ Graphics Control Extension block

C. ____ Interlacing

D. ____ Color lookup table

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 66. The GIF image format has a few interesting features, notwithstanding the fact that it has been largely supplanted. The standard supports *interlacing*—the successive display of pixels in widely spaced rows by a four-pass display process.

What does the term "interlacing" refer to in the context of the GIF standard?

A. ____ Mixing colors to create new shades

B. ✓ Sequential display of pixels in widely spaced rows

C. ____ Compression of image data

D. ____ Encryption of image files

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 67. It is worthwhile examining the file format for GIF87 in more detail, since many such formats bear a resemblance to it but have grown a good deal more complex than this "simple" standard. For the standard specification, the general file format is as in Fig. 3.12. The *Signature* is six bytes: `GIF87a`; the *Screen Descriptor* is a seven-byte set of flags. A GIF87 file can contain more than one image definition, usually to fit on several different parts of the screen. Therefore each image can contain its own

What does the GIF87a file format include after the Signature?

A. ____ Image definition

B. ____ Color lookup table

C. ✓ Screen Descriptor

D. ____ Graphics Control Extension block

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 68. this "simple" standard. For the standard specification, the general file format is as in Fig. 3.12. The *Signature* is six bytes: `GIF87a`; the *Screen Descriptor* is a seven-byte set of flags. A GIF87 file can contain more than one image definition, usually to fit

How many bytes does the Signature in the GIF87a file format occupy?

A. ____ Two bytes

B. ____ Four bytes

C. ✓ Six bytes

D. ____ Eight bytes

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 69. color lookup table, a *Local Color Map*, for mapping 8 bits into 24-bit RGB values. However, it need not, and a global color map can instead be defined to take the place of a local table if the latter is not included.

Which file format does GIF87a use to map 8 bits into 24-bit RGB values?

A. ✓ Local Color Map

B. ____ Global Color Map

C. ____ Animation Descriptor

D. ____ Graphics Control Extension block

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 70. The Screen Descriptor comprises a set of attributes that belong to every image in the file. According to the GIF87 standard, it is defined as in Fig. 3.13. *Screen Width* is given in the first two bytes. Since some machines invert the order MSB/LSB

What does the Screen Descriptor comprise in the GIF87 standard?

A. ____ Color lookup table

B. ____ Image definition

C. ✓ Set of attributes for every image

D. ____ Animation control block

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 71. The Screen Descriptor comprises a set of attributes that belong to every image in the file. According to the GIF87 standard, it is defined as in Fig. 3.13. *Screen Width* is given in the first two bytes. Since some machines invert the order MSB/LSB

How is the Screen Width specified in the Screen Descriptor?

A. ____ As a single byte

B. ✓ In the first two bytes

C. ____ In the last two bytes

D. ____ As a separate block

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 72. the file. According to the GIF87 standard, it is defined as in Fig. 3.13. *Screen Width* is given in the first two bytes. Since some machines invert the order MSB/LSB (most significant byte/least significant byte—i.e., byte order), this order is specified. *Screen Height* is the next two bytes. The 'm' in byte five is zero if no global color

Why is the order of bytes for Screen Width specified as MSB/LSB in the GIF87 standard?

A. ____ To confuse the decoder

B. ____ Due to a mistake in the standard

C. ✓ Because some machines invert byte order

D. ____ As a security measure

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 73. is given in the first two bytes. Since some machines invert the order MSB/LSB (most significant byte/least significant byte—i.e., byte order), this order is specified. *Screen Height* is the next two bytes. The 'm' in byte five is zero if no global color map is given. Color resolution, "cr", is 3 bits in 0..7. Since this is an old standard meant to operate on a variety of low-end hardware, "cr" is *requesting* this much color resolution.

In the context of the GIF87 standard, what does a 'm' value of zero in the fifth byte indicate?

A. ✓ No global color map is given

B. ____ Full color resolution

C. ____ High animation speed

D. ____ Multiple color maps

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 74. is given in the first two bytes. Since some machines invert the order MSB/LSB (most significant byte/least significant byte—i.e., byte order), this order is specified. *Screen Height* is the next two bytes. The 'm' in byte five is zero if no global color map is given. Color resolution, "cr", is 3 bits in 0..7. Since this is an old standard meant to operate on a variety of low-end hardware, "cr" is *requesting* this much color resolution.

How many bits represent color resolution ("cr") in the Screen Descriptor?

A. ____ 2 bits

B. ✓ 3 bits

C. ____ 4 bits

D. ____ 5 bits

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 75. One interesting development stemming from the popularity of the Internet is efforts toward more system-independent image formats. One such format is *Portable Network Graphics* (PNG).This standard is meant to supersede the GIF standard and extends it in important ways. The motivation for a new standard was in part the

What is the name of the image format meant to supersede the GIF standard?

A. ____ JPEG

B. ✓ PNG

C. ____ TIFF

D. ____ BMP

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 76. version, GIF89a, supports simple *animation* via a Graphics Control Extension block in the data. This provides simple control over *delay time*, a *transparency index*, and so on. Software such as Corel Draw allows access to and editing of GIF images.

What software is mentioned as allowing access to and editing of GIF images?

A. ____ Adobe Photoshop

B. ✓ Corel Draw

C. ____ Microsoft Paint

D. ____ GIMP

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 77. extends it in important ways. The motivation for a new standard was in part the patent held by UNISYS and Compuserve on the LZW compression method. (Interestingly, the patent covers only compression, not decompression: this is why the

What motivated the development of the Portable Network Graphics (PNG) format?

A. ____ To enhance color accuracy

B. ✓ The patent held by UNISYS and Compuserve on LZW compression

C. ____ To improve animation capabilities

D. ____ The popularity of the Internet

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 78. extends it in important ways. The motivation for a new standard was in part the patent held by UNISYS and Compuserve on the LZW compression method. (Interestingly, the patent covers only compression, not decompression: this is why the Unix `gunzip` utility can decompress LZW-compressed files).

What is the specific aspect of the LZW compression method covered by the UNISYS and Compuserve patent?

A. ____ Compression and decompression

B. ____ Only decompression

C. ✓ Only compression

D. ____ Color mapping

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 79. *Tagged Image File Format* (TIFF) is another popular image file format. Developed by the Aldus Corporation in the 1980s, it was later supported by Microsoft. Its support for attachment of additional information (referred to as "tags") provides a great deal

Who developed the Tagged Image File Format (TIFF)?

A. ✓ Microsoft

B. ____ UNISYS Corporation

C. ____ Adobe Corporation

D. ____ Aldus Corporation

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 80. for attachment of additional information (referred to as "tags") provides a great deal of flexibility. The most important tag is a format signifier: what type of compression,

What is the most important tag in the TIFF format?

A. ____ Compression Tag

B. ____ Color Tag

C. ____ Resolution Tag

D. ✓ Format Signifier Tag

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c

__ 1 81. of flexibility. The most important tag is a format signifier: what type of compression, etc., is in use in the stored image. For example, TIFF can store many different types of images: 1-bit, grayscale, 8-bit, 24-bit RGB, and so on. TIFF was originally a lossless format, but an added tag allows you to opt for JPEG, JBIG, and even JPEG-2000

What types of images can TIFF store according to the passage?

A. ____ Only 24-bit RGB images

B. ____ Only 1-bit and grayscale images

C. ✓ Various types, including 1-bit, grayscale, 8-bit, 24-bit RGB, etc

D. ____ Only vector-based images

Notes: https://chat.openai.com/c/cc5ce89a-b26c-44d2-b1b6-2d2de7a9665c