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CLASS 9 • CHAPTER 02

Number Systems

**80 Solved MCQs with
Detailed Explanations**

80
MCQs

6
Sections

100%
Explained

Computer Science & Entrepreneurship

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The correct option in every question is highlighted in green and ticked.

1

Introduction & Numbering Systems

Decimal, Binary, Octal & Hexadecimal

Q1–Q15

1 Which of the following is the primary reason computers use the binary number system for data representation?

- (A) It is easy for humans to read.
- (B) It requires less memory than other systems.
- (C) Digital circuits naturally have two states: ON (1) and OFF (0). ✓
- (D) It allows for faster typing on a keyboard.

Explanation

Correct Answer: (C)

Electronic components inside a computer (transistors) work like switches. They are either completely on or completely off. This naturally maps to 1 and 0, making binary the most practical and hardware-friendly system.

2 What is the base (radix) of the Decimal number system?

- (A) 2
- (B) 8
- (C) 10 ✓
- (D) 16

Explanation

Correct Answer: (C)

The decimal system uses ten unique digits (0 through 9). Therefore, its base is 10, and each place value represents a power of 10 (10^0 , 10^1 , 10^2 , etc.).

3 In the binary number system, what is the place value (weight) of the 4th digit from the right?

A 2^2

B 2^3 ✓

C 2^4

D 10^3

Explanation

Correct Answer: B

In binary, place values start from the rightmost digit as 2^0 . Moving left, the exponents increase by 1 for each position (2^0 , 2^1 , 2^2 , 2^3). The 4th position from the right is 2^3 (which equals 8).

4 Which number system uses a base of 8 and digits ranging from 0 to 7?

A Binary

B Octal ✓

C Hexadecimal

D Decimal

Explanation

Correct Answer: B

The octal system is a base-8 system. It uses the digits 0, 1, 2, 3, 4, 5, 6, and 7. Each digit represents a power of 8.

5 In the Hexadecimal number system, what numeric value does the letter 'F' represent?

A 10

B 12

C 15 ✓

D 16

Explanation

Correct Answer: C

Since hexadecimal is base-16, it needs 16 unique symbols. It uses 0-9 for the first ten values and the letters A, B, C, D, E, and F to represent the values 10, 11, 12, 13, 14, and 15 respectively.

6 What is the decimal equivalent of the binary number 1011?

(A) 9

(B) 10

(C) 11



(D) 13

Explanation

Correct Answer: (C)

Multiply each binary digit by its place value (power of 2) and add them:
 $(1 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) = 8 + 0 + 2 + 1 = 11$.

7 Which of the following correctly represents the decimal number 523 in expanded form based on its place values?

(A) $5 \times 10^2 + 2 \times 10^1 + 3 \times 10^0$



(B) $5 \times 10^3 + 2 \times 10^2 + 3 \times 10^1$

(C) $5 \times 2^2 + 2 \times 2^1 + 3 \times 2^0$

(D) $5 \times 10^0 + 2 \times 10^1 + 3 \times 10^2$

Explanation

Correct Answer: (A)

In the decimal system, the rightmost digit is multiplied by 10^0 , the next by 10^1 , and the next by 10^2 . Therefore, $500 + 20 + 3 = 523$.

8 The decimal number 64 in binary is represented as:

A 1000000



B 100000

C 110000

D 100001

Explanation

Correct Answer: A

2^6 equals 64. Therefore, the 7th bit from the right (position 6) must be 1, and all others must be 0. Writing this out gives 1 followed by six 0s (1000000).

9 Which number system is primarily used in modern computers to simplify the representation of large binary numbers?

A Octal

B Decimal

C Hexadecimal



D Unary

Explanation

Correct Answer: C

Hexadecimal is base-16, and since 16 is a power of 2 (2^4), one hexadecimal digit can perfectly represent exactly four binary bits. This makes large binary strings much shorter and easier for humans to read and write.

10 What is the octal equivalent of the binary number 110101011?

A 653



B 563

C 635

D 356

Explanation

Correct Answer: A

Group the binary number into sets of three from right to left: 110 | 101 | 011. Convert each group: 110 = 6, 101 = 5, 011 = 3. Combine them to get 653 in octal.

11 The hexadecimal number 1A3 converts to which decimal number?

A 419



B 391

C 456

D 321

Explanation

Correct Answer: A

Expand the hexadecimal number using powers of 16: $(1 \times 16^2) + (10 \times 16^1) + (3 \times 16^0) = 256 + 160 + 3 = 419$.

12 When converting a decimal number to binary, what is the correct sequence of steps?

- ☐ A Multiply by 2, record the carry, read top to bottom.
- ☒ B Divide by 2, record the remainder, read bottom to top. ✓
- ☐ C Divide by 8, record the remainder, read top to bottom.
- ☐ D Multiply by 16, record the carry, read bottom to top.

Explanation

Correct Answer: B

The repeated division method requires dividing the decimal number by the target base (2). You record the remainders (which will be 0 or 1). You continue until the quotient is 0, then read the remainders in reverse order (bottom to top).

13 What is the binary equivalent of the decimal number 83?

- ☒ A 1010011 ✓
- ☐ B 1100101
- ☐ C 1010101
- ☐ D 1001101

Explanation

Correct Answer: A

Dividing 83 by 2 repeatedly gives remainders: 1, 1, 0, 0, 1, 0, 1.
Reading these from bottom to top gives 1010011.

14 Which of the following is NOT a valid digit in the Octal number system?

(A) 7

(B) 0

(C) 8



(D) 5

Explanation

Correct Answer: (C)

The octal system is base-8, meaning it only uses digits from 0 to 7. The digit 8 does not exist in this system.

15 How many bits are required to represent one Hexadecimal digit?

(A) 2 bits

(B) 3 bits

(C) 4 bits



(D) 8 bits

Explanation

Correct Answer: (C)

Hexadecimal is base-16 (2^4), meaning one hex digit represents exactly 4 binary bits. For example, the hex digit 'F' is 1111 in binary.

2

Data Representation

Integers & Real Numbers

Q16–Q30

16 In computing, what is the standard size of a byte?☐ A 2 bits☐ B 4 bits☒ C 8 bits☐ D 16 bits**Explanation****Correct Answer:** C

A byte is a fundamental unit of digital information, universally defined as a group of 8 bits. It is the smallest addressable unit of memory in most computer architectures.

17 What is the maximum positive value that can be stored in an 8-bit unsigned integer?☐ A 127☐ B 128☒ C 255☐ D 256**Explanation****Correct Answer:** C

An 8-bit unsigned integer has no sign bit, so all 8 bits are used for the value. The maximum value is when all bits are 1 (11111111), which equals $2^8 - 1 = 255$.

18 Which bit is reserved as the sign bit in a signed binary integer representation?

- ☐ A The Least Significant Bit (LSB)
- ☒ B The Most Significant Bit (MSB)
- ☐ C The middle bit
- ☐ D There is no sign bit

Explanation

Correct Answer: B

In signed integer representation, the leftmost bit (MSB) is used to indicate the sign. If it is 0, the number is positive; if it is 1, the number is negative.

19 What is the result of applying Two's Complement to the 8-bit binary number 00000101?

- ☐ A 11111010
- ☒ B 11111011
- ☐ C 00000110
- ☐ D 10000101

Explanation

Correct Answer: B

To find the Two's Complement, first invert all bits (00000101 becomes 11111010). Then, add 1 to the least significant bit ($11111010 + 1 = 11111011$). This represents -5.

20 What is the minimum negative value that can be represented by an 8-bit signed integer using Two's Complement?

(A) -127

(B) -128



(C) -255

(D) -256

Explanation

Correct Answer: B

In 8-bit Two's Complement, the range is from -128 to +127. The value -128 is uniquely represented as 10000000. The formula is $-2^{(n-1)}$, where $n=8$, giving $-2^7 = -128$.

21 How many bytes are typically used to store a single-precision floating-point number?

(A) 2 bytes

(B) 4 bytes



(C) 8 bytes

(D) 16 bytes

Explanation

Correct Answer: B

Single-precision floating-point format uses 32 bits, which equates to exactly 4 bytes. It allocates 1 bit for the sign, 8 bits for the exponent, and 23 bits for the mantissa.

22 In floating-point representation, the formula used to calculate the value is:

A $\text{Sign} \times \text{Mantissa} \times 2^{\text{Exponent}}$ ✓

B $\text{Sign} \times \text{Exponent} \times 2^{\text{Mantissa}}$

C $\text{Mantissa} \times \text{Exponent} \times 2^{\text{Sign}}$

D $\text{Sign} + \text{Mantissa} + \text{Exponent}$

Explanation

Correct Answer: **A**

This is the standard scientific notation used in computing. The sign determines positive/negative, the mantissa holds the significant digits, and the exponent dictates the magnitude (where the decimal point goes).

23 What is the binary representation of the fractional decimal number 0.375?

A 0.011 ✓

B 0.101

C 0.110

D 0.001

Explanation

Correct Answer: **A**

Multiply the fraction by 2 repeatedly: $0.375 \times 2 = 0.75$ (integer part 0), $0.75 \times 2 = 1.5$ (integer part 1), $0.5 \times 2 = 1.0$ (integer part 1). Reading the integer parts from top to bottom gives 011.

24 In the single-precision floating-point format, how many bits are allocated for the exponent?

A 1 bit

B 8 bits



C 23 bits

D 32 bits

Explanation

Correct Answer: B

Single-precision (32-bit) floating-point format divides the 32 bits as follows: 1 bit for the sign, 8 bits for the exponent, and 23 bits for the mantissa.

25 Why is there a bias added to the exponent in floating-point representation?

A To make the number larger.

B To allow for the representation of both positive and negative exponents without using a separate sign bit.



C To convert the number to decimal.

D To simplify the multiplication process.

Explanation

Correct Answer: B

The exponent can be negative (for very small numbers) or positive (for very large numbers). By adding a bias (e.g., 127 for single precision), all exponents become positive integers, which simplifies hardware comparison and arithmetic.

26 What is the minimum exponent value in double-precision floating-point format (before applying bias)?

A -126

B -1022



C -1023

D -127

Explanation

Correct Answer: B

Double precision uses an 11-bit exponent with a bias of 1023. The smallest exponent is calculated by subtracting the bias from the minimum representable value, resulting in a minimum actual exponent of -1022.

27 Which of the following is NOT a component of a floating-point number representation?

A Sign bit

B Mantissa

C Exponent

D Remainder



Explanation

Correct Answer: D

A floating-point number is composed of three main parts: the sign bit, the mantissa (which holds the significant digits), and the exponent (which scales the number). "Remainder" is a term used in integer division, not floating-point representation.

28 What does the term "Mantissa" refer to in floating-point representation?

- ☐ A The sign of the number.
- ☐ B The power of 2 by which the number is multiplied.
- ☒ C The significant digits of the number. ✓
- ☐ D The fractional part of the binary number.

Explanation

Correct Answer: C

The mantissa represents the precision bits of the number (the significant digits). It is similar to the coefficient in scientific notation (e.g., the 1.4375 in 1.4375×2^2).

29 What is the range of the exponent in a 32-bit single-precision floating-point number?

- ☒ A -126 to +127 ✓
- ☐ B -128 to +127
- ☐ C -1022 to +1023
- ☐ D -32768 to +32767

Explanation

Correct Answer: A

With an 8-bit exponent biased by 127, the actual exponent range is from -126 to +127. The extreme values (-127 and +128) are reserved for special cases like infinity and NaN (Not a Number).

30 What is the hexadecimal representation of the binary number 1101011010110010?

A D6B2



B B6D2

C D2B6

D 6DB2

Explanation

Correct Answer: **A**

Group the binary number into sets of four from the right: 1101 | 0110 | 1011 | 0010. Convert each group: 1101 = D, 0110 = 6, 1011 = B, 0010 = 2. The result is D6B2.

3

Binary Arithmetic Operations

Addition, Subtraction, Multiplication & Division

Q31–Q40

31 What is the result of binary addition: $1 + 1$?**A** 10 (which is 0 with a carry of 1) **B** 2 (which is 0 with a carry of 2)**C** 1 (with a carry of 0)**D** 11**Explanation****Correct Answer:** **A**

In binary, $1 + 1$ equals 2. Since 2 is not a valid single binary digit, it is represented as 10, meaning the current digit is 0 and a carry of 1 is passed to the next higher bit.

32 Perform binary addition: $1101 + 1011$. What is the result?**A** 11000 **B** 10110**C** 11100**D** 10010**Explanation****Correct Answer:** **A**

Adding from right to left: $1+1=0$ carry 1; $0+1+1=0$ carry 1; $1+0+1=0$ carry 1; $1+1+1=1$ carry 1. The final carry gives an extra bit, resulting in 11000 (which is $13 + 11 = 24$ in decimal).

33 In binary subtraction, how is the subtraction operation actually performed by the computer's ALU?

- ☐ A By directly subtracting the bits.
- ☐ B By converting to decimal, subtracting, and converting back.
- ☒ C By adding the Two's Complement of the subtrahend to the minuend. ✓
- ☐ D By using a dedicated subtraction circuit.

Explanation

Correct Answer: C

Digital circuits perform subtraction by adding negative numbers. To subtract B from A ($A - B$), the computer finds the Two's Complement of B (which makes it negative) and adds it to A. Any final carry out of the MSB is discarded.

34 What is the result of subtracting 6 from 9 in binary ($9 - 6$) using the Two's Complement method?

- ☒ A 0011 (3 in decimal) ✓
- ☐ B 1101 (13 in decimal)
- ☐ C 1111 (15 in decimal)
- ☐ D 0100 (4 in decimal)

Explanation

Correct Answer: A

9 is 1001, 6 is 0110. The Two's Complement of 6 is 1010. Add $1001 + 1010 = 10011$. Discarding the carry bit (the leftmost 1) leaves 0011, which is 3.

35 What is the primary rule for binary multiplication?

A $1 \times 1 = 2$

B $1 \times 0 = 1$

C $1 \times 1 = 1$ ✓

D $0 \times 0 = 1$

Explanation

Correct Answer: C

Binary multiplication follows the same logic as decimal multiplication for 0s and 1s. The only time the result is 1 is when both bits being multiplied are 1 ($1 \times 1 = 1$). All other combinations result in 0.

36 When multiplying binary numbers, what operation is performed on the partial results?

A Subtraction

B Addition ✓

C Division

D Two's Complement

Explanation

Correct Answer: B

Binary multiplication involves generating partial products (just like decimal long multiplication) and then adding all those partial products together to get the final result. The shifting is done to align the place values before addition.

37 What is the result of multiplying 101 (5 in decimal) by 11 (3 in decimal)?

A 1111 (15 in decimal) ✓

B 1010 (10 in decimal)

C 1100 (12 in decimal)

D 1001 (9 in decimal)

Explanation

Correct Answer: A

$101 \times 1 = 101$. 101×1 (shifted left) = 1010. Adding these gives $101 + 1010 = 1111$, which is 15.

38 Which operation is used in binary division when the divisor is greater than the current portion of the dividend?

A Subtract 1 from the quotient.

B Bring down the next digit. ✓

C Add the divisor to the dividend.

D Multiply the divisor by 2.

Explanation

Correct Answer: B

If the divisor cannot fit into the current portion of the dividend, the quotient bit becomes 0. You then bring down the next bit from the dividend to form a larger number and try again.

39 In the binary division example $1100 \div 10$, what is the quotient?

A 110



B 101

C 11

D 100

Explanation

Correct Answer: A

1100 (12 in decimal) divided by 10 (2 in decimal) equals 110 (6 in decimal). The long division process compares, subtracts, and shifts to arrive at this quotient.

40 The CPU of a modern computer performs millions of binary operations per second. Which unit inside the CPU is primarily responsible for these arithmetic operations?

A Control Unit

B Memory Unit

C Arithmetic Logic Unit (ALU)



D Input/Output Unit

Explanation

Correct Answer: C

The ALU is a digital circuit within the CPU that performs integer arithmetic and bitwise logic operations. It is the core component that executes the actual additions, subtractions, multiplications, and divisions.

4

Text Encoding Schemes

ASCII & Unicode

Q41–Q50

41 What does the acronym ASCII stand for?**A** American Standard Code for Information Interchange ✓**B** Automated System for Computer Information Interchange**C** American Standard Code for International Integration**D** Advanced Standard Code for Information Interchange**Explanation****Correct Answer: A**

ASCII is the standard character encoding scheme used in computers to represent text. It assigns a unique numeric code to letters, digits, and punctuation marks.

42 How many bits are used in the standard ASCII encoding scheme?**A** 4 bits**B** 7 bits ✓**C** 8 bits**D** 16 bits**Explanation****Correct Answer: B**

The standard ASCII table uses 7 bits, which allows it to represent $2^7 = 128$ unique characters. Extended ASCII uses 8 bits (256 characters) but the base standard is 7-bit.

43 What is the ASCII code for the uppercase letter 'A'?

A 61

B 65



C 97

D 41

Explanation

Correct Answer: B

In the standard ASCII table, uppercase letters start at 65 ('A' = 65, 'B' = 66, etc.). Lowercase letters start at 97 ('a' = 97).

44 What is the ASCII code for the lowercase letter 'a'?

A 65

B 90

C 97



D 122

Explanation

Correct Answer: C

Lowercase letters in ASCII begin at 97. 'a' is 97, 'b' is 98, and so on up to 'z' which is 122. This distinction between uppercase and lowercase is crucial for text processing.

45 How many characters can be represented using the Extended ASCII scheme?

A 128

B 256



C 512

D 1024

Explanation

Correct Answer: B

Extended ASCII uses 8 bits per character. 2^8 equals 256, which allows it to include additional symbols, accented letters, and graphical characters beyond the standard 128.

46 What is the primary limitation of ASCII that Unicode aims to solve?

- ☐ A ASCII is too slow.
- ☒ B ASCII cannot represent characters from all the world's writing systems. ✓
- ☐ C ASCII requires too much memory.
- ☐ D ASCII is not compatible with binary.

Explanation

Correct Answer: B

Since ASCII uses only 7 or 8 bits, it can only represent 128 or 256 characters, which is enough for English but not for languages like Urdu, Chinese, or Arabic. Unicode was created to provide a unique code for every character in every language.

47 Which encoding scheme uses a variable-length encoding of 1 to 4 bytes and is backward compatible with ASCII?

- ☐ A UTF-16
- ☐ B UTF-32
- ☒ C UTF-8 ✓
- ☐ D Extended ASCII

Explanation

Correct Answer: C

UTF-8 is designed to be backward compatible with ASCII. The first 128 characters (0-127) are represented exactly the same as standard ASCII (using 1 byte), while other characters use 2, 3, or 4 bytes.

48 How many bytes does UTF-32 use to represent a single character?

A 1 byte

B 2 bytes

C 3 bytes

D 4 bytes



Explanation

Correct Answer: D

UTF-32 is a fixed-length encoding scheme. It always uses exactly 4 bytes (32 bits) for every single character, regardless of how simple or complex the character is.

49 How many bytes does UTF-16 typically use to represent a character?

A 1 or 2 bytes

B 2 or 4 bytes



C 3 bytes

D 4 bytes

Explanation

Correct Answer: B

UTF-16 uses 2 bytes for most common characters, but can use 4 bytes for characters outside the Basic Multilingual Plane (like some rare historical scripts or emojis).

50 Which of the following is TRUE about Unicode?

- ☐ A It is a 7-bit encoding scheme.
- ☐ B It is limited to 256 characters.
- ☒ C It aims to provide a unique number for every character in all world languages. ✓
- ☐ D It is not compatible with modern web browsers.

Explanation

Correct Answer: C

Unicode is a universal character encoding standard. Its goal is to eliminate the confusion of multiple conflicting encoding schemes by providing a single, unified code point for every character, symbol, and emoji used globally.

5

Storing Images, Audio & Video

Pixels, Sampling, Compression & Formats

Q51–Q62

51 What is the smallest unit of a digital image called?☐ A Bit☒ B Pixel☐ C Byte☐ D Frame**Explanation****Correct Answer:** B

An image is made up of a grid of tiny dots called pixels (short for "picture elements"). Each pixel has a specific color, and the combination of millions of these pixels forms the complete picture.

52 In the RGB color model, what is the range of values for each color component (Red, Green, Blue)?☐ A 0 to 1☐ B 0 to 100☒ C 0 to 255☐ D 0 to 1024**Explanation****Correct Answer:** C

Each color channel in an RGB image is typically represented by 8 bits (1 byte). This gives a range of 0 to 255 ($2^8 - 1$), allowing for 256 different intensity levels per color, resulting in over 16 million possible color combinations.

53 Which image file format is known for using lossy compression to significantly reduce file size, making it ideal for photographs on the web?

A PNG

B GIF

C JPEG ✓

D BMP

Explanation

Correct Answer: C

JPEG (Joint Photographic Experts Group) uses lossy compression, meaning it discards some visual data that the human eye is less likely to notice. This makes it very efficient for storing complex photographs with small file sizes.

54 Which image format supports transparency and maintains high quality without losing data, making it ideal for logos and graphics?

A JPEG

B PNG ✓

C MP3

D AVI

Explanation

Correct Answer: B

PNG (Portable Network Graphics) uses lossless compression, meaning no image data is lost during saving. It also supports an alpha channel, allowing for transparent backgrounds.

55 What is the process of recording a sound wave at regular intervals called?

A Quantization

B Sampling ✓

C Compression

D Encoding

Explanation

Correct Answer: B

Sampling is the first step in digitizing audio. The continuous analog sound wave is measured (sampled) at regular time intervals. The number of samples taken per second is called the sampling rate.

56 What is the process of converting each audio sample into a discrete numerical value called?

A Sampling

B Quantization ✓

C Modulation

D Filtering

Explanation

Correct Answer: B

After sampling, the amplitude of each sample is rounded to the nearest available digital value. This process is called quantization. More bits per sample result in more accurate sound representation.

57 Which audio file format is uncompressed and maintains the highest quality, but results in very large file sizes?

A MP3

B WAV



C AAC

D FLAC

Explanation

Correct Answer: B

WAV (Waveform Audio File Format) stores audio data in an uncompressed format. It is often used in professional audio recording and editing where quality is paramount, but the file sizes are significantly larger than compressed formats like MP3.

58 What is the number of frames displayed per second in a video called?

A Resolution

B Bitrate

C Frame Rate



D Aspect Ratio

Explanation

Correct Answer: C

Video is essentially a series of still images (frames) played in rapid succession. The frame rate, measured in Frames Per Second (FPS), determines how smooth the motion appears. Standard rates are 24 fps (movies) and 30 fps (TV).

59 Which video file format is known for its efficiency in compressing video while maintaining good quality, and is widely used for streaming and sharing?

A AVI

B MP4



C WAV

D PNG

Explanation

Correct Answer: B

MP4 (MPEG-4 Part 14) is one of the most common video container formats. It uses advanced compression algorithms to balance high video quality with manageable file sizes, making it ideal for internet streaming and mobile devices.

60 What does the term "lossy" mean in the context of multimedia file formats?

A The file can be recovered if deleted.

B Some data is permanently removed to reduce file size.



C The file is encrypted.

D The file requires a special codec to play.

Explanation

Correct Answer: B

Lossy compression algorithms (like MP3, JPEG, MP4) achieve smaller file sizes by discarding some of the original data. This data cannot be recovered, but the loss is usually designed to be imperceptible to human senses.

61 Which of the following is an example of a lossless image format?

A JPEG

B MP3

C PNG ✓

D MP4

Explanation

Correct Answer: C

PNG uses lossless compression, meaning the image is compressed without losing any quality or data. When you open a PNG, it is exactly the same as the original.

62 What unit is used to measure the resolution of a digital image?

A Hertz (Hz)

B Pixels per inch (PPI) ✓

C Bits per second (bps)

D Frames per second (fps)

Explanation

Correct Answer: B

PPI (or DPI - Dots Per Inch) measures the pixel density of an image. Higher PPI means more pixels are packed into a square inch, resulting in a sharper, higher-resolution image.

6

Data Storage & Units

Storage Devices, Conversions & Review

Q63–Q80

63 How many bytes are there in one Kilobyte (KB)?**A** 1000 bytes**B** 1024 bytes ✓**C** 512 bytes**D** 2048 bytes**Explanation****Correct Answer: B**

In computing, storage units are based on powers of 2. A Kilobyte is 2^{10} bytes, which equals 1024 bytes. (Note: Some manufacturers use 1000, but the binary standard taught in computer science is 1024).

64 Arrange the following storage units in increasing order of size:**A** KB, MB, GB, TB ✓**B** MB, KB, GB, TB**C** TB, GB, MB, KB**D** GB, TB, KB, MB**Explanation****Correct Answer: A**

The hierarchy of digital storage units is Kilobyte (KB), Megabyte (MB), Gigabyte (GB), and Terabyte (TB). Each is 1024 times larger than the previous one.

65 How many Megabytes (MB) are there in one Gigabyte (GB)?

(A) 1000

(B) 1024



(C) 512

(D) 2048

Explanation

Correct Answer: B

Just like a Kilobyte is 1024 bytes, a Megabyte is 1024 Kilobytes, and a Gigabyte is 1024 Megabytes. This consistent factor of 1024 (2^{10}) is a cornerstone of digital storage.

66 Which storage device uses spinning magnetic disks to read and write data?

(A) Solid State Drive (SSD)

(B) Hard Disk Drive (HDD)



(C) Cloud Storage

(D) USB Flash Drive

Explanation

Correct Answer: B

HDDs are traditional storage devices that use rotating magnetic platters and a mechanical read/write head. They offer large storage capacities at a lower cost but are slower than SSDs.

67 What was the storage capacity of the first hard drive created by IBM in 1956?

A 5 MB

B 5 KB

C 5,000,000 bytes



D 1 GB

Explanation

Correct Answer: C

The IBM 305 RAMAC, the first hard disk drive, weighed over a ton and could store only 5 million characters (about 5 MB). This highlights the incredible evolution of storage technology.

68 Which type of storage stores files on remote servers accessible via the internet?

A Local HDD

B Local SSD

C Cloud Storage



D Optical Disc

Explanation

Correct Answer: C

Cloud storage allows users to save data on remote servers maintained by a third party (like Google, Amazon, or Microsoft). The data is accessed over the internet, providing flexibility and backup options.

69 What is the binary representation of the decimal number 25?

A 11001



B 10101

C 10011

D 11010

Explanation

Correct Answer: A

Dividing 25 by 2 gives remainders: 1, 0, 0, 1, 1. Reading from bottom to top yields 11001. ($16 + 8 + 1 = 25$).

70 What is the decimal equivalent of the octal number 57?

A 47



B 57

C 67

D 75

Explanation

Correct Answer: A

Expand the octal number using powers of 8: $(5 \times 8^1) + (7 \times 8^0) = 40 + 7 = 47$.

71 What is the hexadecimal equivalent of the decimal number 2297?

A 8F9



B 9F8

C F89

D 98F

Explanation

Correct Answer: A

Divide 2297 by 16 repeatedly: $2297/16 = 143$ remainder 9; $143/16 = 8$ remainder 15 (F); $8/16 = 0$ remainder 8. Reading remainders bottom to top gives 8F9.

72 Which of the following is NOT a valid file extension for an image file?

A .jpg

B .png

C .gif

D .mp3



Explanation

Correct Answer: D

.mp3 is an audio file extension. The others (.jpg, .png, .gif) are common image file formats.

73 What does the term "bit" stand for?

A Binary Digit ✓

B Basic Information Token

C Binary Integer

D Byte Information Transfer

Explanation

Correct Answer: A

A bit is the most basic unit of information in computing. It is a portmanteau of "binary digit" and can hold only one of two values: 0 or 1.

74 How many bits are there in 1 Kilobyte (KB)?

A 1024 bits

B 8192 bits ✓

C 1024 bytes

D 8192 bytes

Explanation

Correct Answer: B

1 Kilobyte = 1024 Bytes. Since 1 Byte = 8 bits, $1024 \times 8 = 8192$ bits. This calculation is crucial for understanding data transfer rates vs. storage sizes.

75 In the context of digital storage, what does "SSD" stand for?

A Super Speed Disk

B Solid State Drive ✓

C Secure Storage Device

D System Storage Disk

Explanation

Correct Answer: B

SSD stands for Solid State Drive. Unlike HDDs, SSDs have no moving parts; they use flash memory to store data, resulting in faster access times, lower power consumption, and greater durability.

76 Which of the following is true about the ASCII code for the letter 'P'?

A It is 80. ✓

B It is 81.

C It is 112.

D It is 113.

Explanation

Correct Answer: A

According to the standard ASCII table, the uppercase letter 'P' is assigned the decimal value 80.

77 What is the binary representation of the ASCII character 'A' (which has a decimal value of 65)?

A 1000001 ✓

B 1000010

C 1100001

D 10000001

Explanation

Correct Answer: A

65 in binary is $64 + 1$, which is $2^6 + 2^0$. Therefore, the 7th bit and the 1st bit are 1, giving 1000001 (7-bit ASCII).

78 In the context of floating-point numbers, what does "Single Precision" typically refer to?

A 16-bit representation

B 32-bit representation ✓

C 64-bit representation

D 128-bit representation

Explanation

Correct Answer: B

Single precision is the standard IEEE 754 format that uses 32 bits in total: 1 for sign, 8 for exponent, and 23 for the mantissa.

79 Which of the following components of the CPU is responsible for performing arithmetic and logical operations?

A Control Unit (CU)

B Arithmetic Logic Unit (ALU) ✓

C Registers

D Cache

Explanation

Correct Answer: B

The ALU is the digital circuit that performs integer arithmetic and bitwise logic operations. It is a fundamental building block of the CPU.

80 What is the main advantage of using Hexadecimal over Binary when writing or reading code?

A Hexadecimal uses fewer digits to represent the same number. ✓

B Hexadecimal is faster for the computer to process.

C Hexadecimal is the native language of the CPU.

D Hexadecimal can represent negative numbers without a sign bit.

Explanation

Correct Answer: A

Since one hex digit equals exactly four binary bits, a long binary string can be condensed into a much shorter hex string. This makes it much easier for humans to read, write, and debug computer memory addresses and data.

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Well Done, Keep Going!

You have completed all 80 MCQs of
Chapter 02 — Number Systems.

Revision tips

- Practise conversions between binary, octal, decimal & hex.
- Re-attempt the questions you got wrong.
- Learn the ASCII codes and storage units by heart.

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