

REVISION WORKSHEET - GRADE 7 (Solved)

UNIT: 4 COMPUTER SYSTEMS

Topics 4.1, 4.2, 4.3

1. Define System Software and give two examples?

Answer:(similar answer can be accepted)

System software is the set of programs that manage the computer hardware and provide a platform for running application software. It includes operating systems and utility programs that control, manage, and support the computer's basic functions.

Examples: 1) Operating System (e.g. Windows, macOS, Linux)

2) Device drivers or utility programs (e.g. Disk Cleanup Tool, system utilities).

2. Fatima is creating a short podcast for her computing class. She records her voice using a microphone connected to her computer. Later, she edits the file using audio software.

a) Explain how her voice is converted into binary data.

Answer (similar answer can be accepted):

When Fatima speaks, the microphone converts the sound (an analog wave) into an electrical signal. An Analog-to-Digital Converter (ADC) then samples the signal at regular intervals (sampling) and measures the amplitude of the wave at each sample. Each measured value is quantized to the nearest level determined by the bit depth, and then those quantized values are encoded as binary numbers (0s and 1s). The sequence of binary numbers represents the recorded sound that the computer can store and process.

2b) Fatima chooses a higher sampling rate when saving her audio. What effect will this have on the file size and sound quality?

Answer(similar answer can be accepted):

Using a higher sampling rate increases the number of samples taken per second. This generally improves the sound quality (more accurate representation of the original analog wave) but also increases the file size because more samples must be stored.

3. Tick the correct category for each software: (Microsoft Word, Antivirus, Google Chrome, Operating System, Disk Cleanup Tool, Spreadsheet software)

Answer :

Microsoft Word — Application software

Antivirus — System software (utility/security utility)

Google Chrome — Application software (web browser)

Operating System — System software

Disk Cleanup Tool — System software (utility)

Spreadsheet software — Application software (e.g., MS Excel)

4. What is the purpose of an operating system?

Answer(similar answer can be accepted):

An operating system (OS) manages the computer hardware and provides services for running application programs. The OS handles tasks such as managing memory, scheduling processes/CPU time, controlling input/output devices, providing a user interface, and managing files and security.

5. Convert these denary (decimal) numbers to binary:

- a) 25
- b) 128
- c) 76
- d) 100

Answer(similar answer can be accepted) :

- a) $25 = 11001_2$ ($16 + 8 + 1$)
- b) $128 = 10000000_2$ (128)
- c) $76 = 1001100_2$ ($64 + 8 + 4$)
- d) $100 = 1100100_2$ ($64 + 32 + 4$)

6. Convert the following binary numbers to denary:

- a) 00001111
- b) 11110000
- c) 10101010

Answer (teacher style):

- a) $00001111_2 = 15$ ($8+4+2+1$)
- b) $11110000_2 = 240$ ($128+64+32+16$)
- c) $10101010_2 = 170$ ($128+32+8+2$)

7. What does ASCII stand for, and what is it used for?

Answer(similar answer can be accepted):

ASCII stands for American Standard Code for Information Interchange. It is a character encoding standard used to represent text characters (letters, digits, punctuation and control codes) as numeric codes so computers can store and exchange text.

8. How many characters can ASCII represent?

Answer(similar answer can be accepted):

Original ASCII is a 7-bit code and can represent 128 characters (codes 0–127). An extended 8-bit version is often used and supports 256 values (0–255).

9. What is Unicode? Why is it used instead of ASCII in many modern systems?

Answer(similar answer can be accepted):

Unicode is a universal character-encoding standard that assigns a unique code point to characters from almost all of the world's writing systems. It is used instead of ASCII because Unicode supports many more characters and scripts (e.g., Arabic, Chinese, emoji), allowing consistent representation and exchange of multilingual text across different systems.

10. Circle the correct answer:

- Binary uses how many digits? a) 8 b) 10 c) 2 d) 4
- Which of the following best describes sampling rate?
 - a) Bits used per sample
 - b) Height of the wave
 - c) Number of samples per second
 - d) Number of bits per file

Answer :(similar answer can be accepted)

Binary uses how many digits? — c) 2 (binary uses two digits: 0 and 1)

Sampling rate description — c) Number of samples per second

11-12 (Matching audio terms):

Match each audio term to its definition using the letters provided.

Terms: Amplitude, Frequency, Bit depth, Sampling rate

Definitions:

- A. Number of bits used to store each sample
- B. Height of the sound wave
- C. Number of times the sound is measured per second
- D. Number of sound wave cycles per second

Answer):

Amplitude → B (Height of the sound wave)

Frequency → D (Number of sound wave cycles per second)

Bit depth → A (Number of bits used to store each sample)

Sampling rate → C (Number of times the sound is measured per second)

14. Fill in the blanks:

- Increasing the sampling rate results in _____ sound quality and _____ file size.
- A sound wave with higher frequency will have a _____ pitch.

Answer :

- Increasing the sampling rate results in increased (better) sound quality and increased (larger) file size.
- A sound wave with higher frequency will have a higher pitch.

15. Briefly explain how sound is stored on a computer using binary.

Answer (similar answer can be accepted):

Sound is stored digitally by sampling the analog sound wave at regular intervals (sampling rate). Each sample's amplitude is measured and quantized to a discrete level determined by the bit depth. These quantized amplitude values are then encoded as binary numbers (sequences of 0s and 1s). The series of binary values for all samples represents the audio file that can be saved, processed and played back by a computer.

16. Write the first four place values of base 8 number system (Octal)

Answer :

The first four place values (from right to left) in base 8 are:

$$8^0 = 1, 8^1 = 8, 8^2 = 64, 8^3 = 512$$

17. A sound is sampled at 550 samples per second, what is the sampling rate in KHz?

Answer :

$$\text{Sampling rate in kHz} = 550 \text{ samples/second} \div 1000 = 0.55 \text{ kHz}$$