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Computer Memory, Storage and Hardware Components

Name: _____

Class: _____

1. A student runs several large spreadsheet files and web browsers at the same time. The computer becomes slow, but closing some programs restores speed. Which upgrade is most likely to improve performance?

A. Increase the amount of RAM

B. Replace the ROM chip with a larger one

C. Install a faster network interface card only

D. Reduce the word length of the processor

2. Which of the following statements about memory is/are correct?
I. Cache memory is faster to access than main RAM.
II. ROM is typically non-volatile and stores firmware such as the boot program.
III. A 64-bit memory address can identify a larger addressable memory space than a 32-bit memory address.

A. I only

B. I and II only

C. II and III only

D. I, II and III

3. A school library stores infrequently used backup copies of yearbooks on magnetic tape rather than on SSD. Which characteristic best explains this choice?

A. Tape provides sequential access at a high unit cost per gigabyte compared with SSD

B. Tape is suitable for low-cost, high-capacity, non-volatile archival storage

C. Tape is volatile, so data cannot be changed after writing

D. Tape always has a higher data transfer rate than SSD for random reads

4. Without compression or spare capacity, how many 2 TB hard disks are needed to store one hundred 300 GB video files?
(Use 1 TB = 1000 GB for this calculation.)

A. 14

B. 15

C. 16

D. 20

5. Mei wants to edit and render 4K video on her desktop. Besides a more powerful CPU, which pair of components should she prioritise?

A. GPU and RAM

B. ROM and barcode scanner

C. Only an optical disc drive

D. Only a basic sound card without more memory

6. Which statement best describes the roles of the bus system and storage devices in a computer?

A. Buses permanently store user documents; storage devices only decode instructions

B. Buses transfer signals between components; storage devices hold data and programs

C. Buses replace the need for any input devices

D. Storage devices only move data between registers inside the ALU

7. In the fetch–decode–execute cycle, which CPU component is mainly responsible for decoding an instruction?

A. Arithmetic and logic unit (ALU)

B. Control unit (CU)

C. System buses only

D. Accumulator alone without the CU

8. A processor is advertised as 3.6 GHz with 8 cores. What do these figures mainly indicate?

A. ROM capacity and screen resolution

B. Clock speed related to timing of operations, and number of processing units that can work in parallel

C. Only the size of magnetic tape backup

D. Number of USB ports and printer dpi

9. A café needs to print kitchen orders quickly at the counter. The printouts need not be archived for years. Why might a thermal printer be preferred to a large office laser printer?
(1) Thermal printers are often smaller and suitable for a tight counter space.
(2) Thermal printers can be simple and fast for short text receipts and tickets.
(3) Thermal print is always more permanent than laser print for long-term legal archives.

A. (1) only

B. (1) and (2) only

C. (2) and (3) only

D. (1), (2) and (3)

10. A team will collect short survey answers from visitors at a busy shopping mall in Tsim Sha Tsui. Which device choice is most appropriate and why?

A. Desktop PCs with large plotters only, for maximum paper size

B. Portable tablets for on-site touch or stylus entry of responses

C. Only fixed barcode scanners with no screen for questions

D. Mainframe terminals permanently fixed in the school office

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答案

1 A

Programs and their data in use are held in RAM.

When too many applications are open, RAM fills up and the system slows down. Adding RAM lets more programs stay in main memory at once.

ROM stores firmware that is not used as working memory for open applications, and a network card mainly affects network speed, not multitasking of local programs.

2 D

I is correct: cache sits closer to the CPU and has lower access latency than main RAM.

II is correct: ROM keeps its contents when power is off and often holds bootstrap code.

III is correct: more address bits mean more unique addresses, so a larger maximum accessible memory space.

Therefore all three statements are correct.

3 B

Magnetic tape offers high capacity at relatively low cost and is non-volatile, which suits long-term backup that is rarely read.

Tape uses sequential access, so it is slower for random retrieval than SSD, but speed is less critical for cold archives. Volatility does not apply to tape or SSD in normal use—both retain data without power.

4 B

Total data size = 100 × 300 GB = 30 000 GB.

Each disk holds 2 TB = 2 × 1000 GB = 2000 GB.

Number of disks = 30 000 ÷ 2000 = 15.

Exactly 15 disks store the full amount with no remaining files.

5 A

Video editing and rendering benefit from a strong GPU for graphics and parallel rendering tasks, and from sufficient RAM to hold large video projects in main memory.

A barcode scanner and ROM capacity are not key factors for this workload. Optical media are not the main working store during intensive editing.

6 B

The bus system carries data, addresses and control signals between the CPU, memory and other components.

Storage devices hold programs and data for longer-term or secondary use (and main memory holds working data).

Buses do not permanently store user files; storage devices are not primarily for decoding instructions—that is a CPU function.

7 B

The control unit (CU) fetches instructions and decodes (interprets) them, then signals other parts of the CPU to carry out the operation.

The ALU performs arithmetic and logic operations after decoding. Buses move signals. Registers hold temporary values such as the current instruction, but decoding is done by the CU.

8 B

Clock frequency (3.6 GHz) indicates how many clock cycles per second the CPU can use, which relates to how quickly it can work through instruction steps when other factors are equal.

Cores (8) indicate how many processing units can work on tasks in parallel.

These figures do not state ROM chip size or the physical width of the case.

9 B

(1) is a valid reason: compact thermal printers fit small counters.

(2) is a valid reason: they are commonly used for fast, short text receipts and orders.

(3) is not correct: thermal prints often fade more easily and are less ideal for long-term archives than laser prints.

So only (1) and (2) support the choice.

10 B

Tablet computers are portable, can capture touch input on-site, and are easier to carry while standing in a mall than full desktop systems.

A heavy desktop with only a wired keyboard is impractical outdoors or in crowded public spaces. Relying only on a bulk scanner without a portable input device does not fit short questionnaire entry. A plotter is for large technical drawings, not survey answers.