HỌC VIỆN KTMM **PHÒNG KT&ĐBCLĐT** ĐỀ THI CHÍNH THỨC *(Đề thi có 6 trang)*	**ĐỀ THI MẪU ĐỂ CÔNG BỐ** **Môn thi: TIẾNG ANH CHUYÊN NGÀNH** *Thời gian làm bài: 90 phút, không kể thời gian phát đề*

Họ, tên thí sinh: ....
Số báo danh: ....

Mã đề thi 424

I. Answer the following questions

Câu 1. List at least three bounded or guided transmission medium you know.

Câu 2. Which type of electronic components does a resistor belong to? What is it used for in electronic circuit?

Câu 3. What is optical fiber. What is it used for? What is a fiber optic cable composed of?

Câu 4. What do AM and FM stand for? What are they?

Câu 5. What are analogue electronics?

II. Choose the best answer A, B, C or D

Câu 6. Robots have replaced humans in performing _________ tasks which humans prefer not to do, or are unable to do.

A. sensitive and repeated
B. confidential and special
C. important and sensitive
D. repetitive and dangerous

Câu 7. Which of the following challenges do designers or developers have when designing software for the embedded system?

A. time-to-prototype
B. time-to-market
C. constraints on the software size
D. All are correct

Câu 8. A CPU is composed of an Arithmetic Logic Unit, a Control Unit, and many internal registers that are connected by _________.

A. slots
B. directions
C. buses
D. routes

Câu 9. If a digital electronic device is to interact with the real world, it will always need an _____________

A. digital interface
B. user interface
C. analogue interface
D. All are correct

Câu 10. Which of the following parts doesn't an early radio transmitter usually consist?

A. A modulator circuit
B. An electronic oscillator circuit
C. a power supply circuit
D. mixed –signal circuits

Câu 11. Which of the following platforms Ccomputer-aided design systems exist for?

A. Linux, UNIX
B. Mac OS X
C. Windows
D. All are correct

Câu 12. __________ the violation of time constraints will result in degraded quality, the system can continue to operate.

A. Because
B. Although
C. As a result
D. Since

Câu 13. Most embedded systems are _________ microcontrollers, which run faster than a custom-built system with a microprocessor.

A. used for
B. set in
C. made of
D. built on

Câu 14. A robot is a machine programmed by a computer and it is capable of carrying out a complex series of _________ automatically.

A. tasks
B. actions
C. activities
D. duties

Câu 15. ___________is the encoding of information in a carrier wave by varying the instantaneous frequency of the wave.

A. Radio frequency
B. Frequency modulation
C. direct current
D. carrier signal

III. Reading the passages (30pts)

Part A. Answer the questions (16 pts, questions 16-23)

A microprocessor is a computer processor where the data processing logic and control is included on a single integrated circuit, or a small number of integrated circuits. The microprocessor contains the arithmetic, logic, and control circuitry required to perform the functions of a computer's central processing unit. The integrated circuit is capable of interpreting and executing program instructions and performing arithmetic operations. The microprocessor is a multipurpose, clock-driven, register-based, digital integrated circuit that accepts binary data as input, processes it according to instructions stored in its memory, and provides results (also in binary form) as output. Microprocessors contain both combinational logic and sequential digital logic, and operate on numbers and symbols represented in the binary number system.

Structure

The complexity of an integrated circuit is bounded by physical limitations on the number of transistors that can be put onto one chip, the number of package terminations that can connect the processor to other parts of the system, the number of interconnections it is possible to make on the chip, and the heat that the chip can dissipate. Advancing technology makes more complex and powerful chips feasible to manufacture.

A minimal hypothetical microprocessor might include only an arithmetic logic unit (ALU), and a control logic section. The ALU performs addition, subtraction, and operations such as AND or OR. Each operation of the ALU sets one or more flags in a status register, which indicate the results of the last operation (zero value, negative number, overflow, or others). The control logic retrieves instruction codes from memory and initiates the sequence of operations required for the ALU to carry out the instruction. A single operation code might affect many individual data paths, registers, and other elements of the processor.

As integrated circuit technology advanced, it was feasible to manufacture more and more complex processors on a single chip. The size of data objects became larger; allowing more transistors on a chip allowed word sizes to increase from 4- and 8-bit words up to today's 64-bit words. Additional features were added to the processor architecture; more on-chip registers sped up programs, and complex instructions could be used to make more compact programs. Floating-point arithmetic, for example, was often not available on 8-bit microprocessors, but had to be carried out in software. Integration of the floating-point unit, first as a separate integrated circuit and then as part of the same microprocessor chip, sped up floating-point calculations.

Occasionally, physical limitations of integrated circuits made such practices as a bit slice approach necessary. Instead of processing all of a long word on one integrated circuit, multiple circuits in parallel processed subsets of each word. While this required extra logic to handle, for example, carry and overflow within each slice, the result was a system that could handle, for example, 32-bit words using integrated circuits with a capacity for only four bits each.

The ability to put large numbers of transistors on one chip makes it feasible to integrate memory on the same die as the processor. This CPU cache has the advantage of faster access than off-chip memory and increases the processing speed of the system for many applications. Processor clock frequency has increased more rapidly than external memory speed, so cache memory is necessary if the processor is not to be delayed by slower external memory.

Câu 16. What are the functions of an arithmetic logic unit?

Câu 17. What makes word sizes increase on a single chip?

Câu 18. What does the control logic do so that the Arithmetic Logic Unit is able to perform the instruction?

Câu 19. Is it possible or impossible to make more complex and powerful chips? Why is it possible or why is it impossible?

Câu 20. What circuits does a microprocessor contain? Why does it need them?

Câu 21. Why is cache memory necessary if the processor is not to be delayed by slower external memory?

Câu 22. What is the benefit of CPU cache compare to off -chip memory?

Câu 23. What makes an integrated circuit design very complex?

Part B. Decide if the following sentences are True (T), False (F)or Not given (NG). Write T, F, or NG next to the sentences (14pts, questions 24-30)

Higher-Order Policy Convergence and Network Monitoring

So far we have focused on very basic concepts that are common and easily implemented by network engineering groups. Finding network professionals with experience performing such functions or even training those without prior experience is not difficult. Another security practice that adds value to a networked industrial space is convergence, which is the adoption and integration of security across operational boundaries. This means coordinating security on both the IT and OT sides of the organization. Convergence of the IT and OT spaces is merging, or at least there is active coordination across formerly distinct IT and OT boundaries.

From a security perspective, the value follows the argument that most new networking and compute technologies coming to the operations space were previously found and established in the IT space. It is expected to also be true that the practices and tools associated with those new technologies are likely to be more mature in the IT space. There are advanced enterprise-wide practices related to access control, threat detection, and many other security mechanisms that could benefit OT security. As stated earlier, the key is to adjust the approach to fit the target environment. Several areas are more likely to require some kind of coordination across IT and OT environments. Two such areas are remote access and threat detection. For remote access, most large industrial organizations backhaul communication through the IT network. Some communications, such as email and web browsing, are obvious communication types that are likely to touch shared IT infrastructure.

Often vendors or consultants who require some kind of remote access to OT assets also traverse the IT side of the network. Given this, it would be of significant value for an OT security practitioner to coordinate access control policies from the remote initiator across the Internet-facing security layers, through the core network, and to a handoff point at the industrial demarcation and deeper, toward the IoT assets. The use of common access controls and operational conditions eases and protects network assets to a greater degree than having divergent groups creating ad hoc methods. Using location information, participant device security stance, user identity, and access target attributes are all standard functions that modern access policy tools can make use of. Such sophistication is a relatively new practice in industrial environments, and so, if these functions are available, an OT security practitioner would benefit from coordination with his or her IT equivalents. Network security monitoring (NSM) is a process of finding intruders in a network. It is achieved by collecting and analyzing indicators and warnings to prioritize and investigate incidents with the assumption that there is, in fact, an undesired presence.

The practice of NSM is not new, yet it is not implemented often or thoroughly enough even within reasonably mature and large organizations. There are many reasons for this underutilization, but lack of education and organizational patience are common reasons. To simplify the approach, there is a large amount of readily available data that, if reviewed, would expose the activities of an intruder. It is important to note that NSM is inherently a process in which discovery occurs through the review of evidence and actions that have already happened. This is not meant to imply that it is a purely postmortem type of activity. If you recognize that intrusion activities are, much like security, an ongoing process, then you see that there is a similar set of stages that an attacker must go through. The tools deployed will slow that process and introduce opportunities to detect and thwart the attacker, but there is rarely a single event that represents an attack in its entirety. NSM is the discipline that will most likely discover the extent of the attack process and, in turn, define the scope for its remediation.

Câu 24. Finding network professionals with experience performing such functions or even training those without prior experience is difficult.

A. True **B**. False

C. Not given

Câu 25. Another security practice that adds value to a networked industrial space is convergence, which is the adoption and integration of security across operational boundaries.

A. True **B**. False

C. Not given

Câu 26. It is not expected to also be true that the practices and tools associated with those new technologies are likely to be more mature in the IT space.

A. True **B**. False

C. Not given

Câu 27. The computer functions are mentioned in the text.

A. True **B**. False **C**. Not given

Câu 28. Some communications, such as email and web browsing, are not obvious communication types that are likely to touch shared IT infrastructure.

A. True **B**. False **C**. Not given

Câu 29. Often vendors or consultants who require some kind of remote access to OT assets also traverse the IT side of the network

A. True **B**. False **C**. Not given

Câu 30. There are not many reasons for this underutilization, but lack of education and organizational patience are common reasons.

A. True **B**. False **C**. Not given

Câu 31. IV. Translation (30 pts): Translate into Vietnamese.

Digital signal processors

Signal processors started out as special processors that were designed for implementing digital signal processing (DSP) algorithms. A good example of a DSP function is the finite impulse response (FIR) filter. This involves setting up two tables, one containing sampled data and the other filter coefficients that determine the filter response. The program then performs a series of repeated multiply and accumulates using values from the tables. The bandwidth of such filters depends on the speed of these simple operations. With a general-purpose architecture like the M68000 family the code structure would involve setting up two tables in external memory, with an address register allocated to each one to act as a pointer. The beginning and the end of the code would consist of the loop initialisation and control, leaving the multiply–accumulate operations for the central part.

The M68000 instruction set does offer some facilities for efficient code: the incremental addressing allows pointers to progress down the tables automatically, and the decrement and branch instruction provides a good way of implementing the loop structures. However, the disadvantages are many: the multiply takes >40 clocks, the single bus is used for all the instruction fetches and table searches, thus consuming time and bandwidth. In addition the loop control timings vary depending on whether the branch is taken or not. This can make bandwidth predictions difficult to calculate. This results in very low bandwidths and is therefore of limited use within digital signal processing. This does not mean that an MC68000 cannot perform such functions: it can, providing performance is not of an issue. RISC architectures like the PowerPC family can offer some immediate improvements.

The capability to perform single cycle Embedded processors 69 arithmetic is an obvious advantage. The Harvard architecture reduces the execution time further by allowing simultaneous data and instruction fetches. The PowerPC can, by virtue of its high performance, achieve performances suitable for many DSP applications. The system cost is high involving a multiple chip solution with very fast memory etc.

----------------------- *Hết* -----------------------