

國立中正大學

112 學年度碩士班招生考試

試題

[第 1 節]

科目名稱	計算機概論
系所組別	資訊管理學系- 甲組 乙組
	資訊管理學系醫療資訊管理

—作答注意事項—

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科目名稱：計算機概論

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[Session I] Multiple Choice 選擇題(單選，每題 3 分)

Choose ONE answer only for each question (3 points for each question)

1. The memory location of a certain program is $DC20_{(16)}$ to $E0B9_{(16)}$, how many bytes is the memory occupied by this program?
A. 1.28K B. 7.81K C. 0.488K D. 1.15K
2. Which of the following value is $BCD_{(16)}$'s 15's Complement?
A. 433 B. 432 C. 68B D. 6AD
3. What is the average rotation time to locate the specific sector in a disk which rotates at the speed of 5400 revolutions per minute?
A. 5.6msec B. 11.1msec C. 8.3msec D. 83msec
4. Which of the following item is not an input signal of CPU?
A. Interrupt Request B. Data Bus C. Address Bus D. DMA Request
5. Which of the following has the shortest fetch speed?
A. Index Addressing B. Relative Addressing
C. Absolute Addressing D. Indirect Addressing
- 6 What is a logic error?
A. An error that occurs when a program is running because, for example, the wrong operator was used.
B. An error in a statement that does not conform to the syntax of the programming language.
C. An error in the hardware from overheating.
D. An error introduced by the compiler when it guesses at how to fix a syntax error.
7. The ping program use which of the following protocol?
A. LDAP(lightweight directory access protocol)
B. SAP(session announcement protocol)
C. ICMP(internet control message protocol)
D. SNMP(simple network management protocol)
8. What is the approach that attackers use role playing to represent themselves as people of authority who are requesting information?
A. trapdoor B. social engineering
C. data diddling D. Trojan horse

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[Session II] Problems and Calculations 計算與簡答題

1. (5 pts) Express the following function in a simplified product of sums and implement it using only NOR gate:

$$F(W, X, Y, Z) = \sum m(3, 4, 6, 11, 12, 13, 14) + \sum d(9, 15)$$

2. (a) (8 pts) What is SOP and POS respectively?

(b) (8 pts) Use simplified F together with its don't care condition d with SOP and POS respectively.

$$F(A, B, C, D) = \sum(0, 1, 2, 8, 9, 12, 13)$$

$$d(A, B, C, D) = \sum(10, 11, 14, 15)$$

3. (a) (4 pts) A non-pipeline processor A has an average Clock Per Instruction of 4 and has a clock rate of 40MHz. What is the Million Instruction Per Second rate of the processor?

(b) (4 pts) A four-stage pipeline processor B has the same clock rate as processor A, what is the maximum speedup of processor B compared with A?

4. Accounts for the following algorithms, what are the worst time, average time, extra memory need, and stability while using the algorithm to sort n object?

(a) (16 pts) bubble sort

(b) (16 pts) quick sort

5. For the following I/O interfaces, please explain how do they work, the differences between them, and their efficiency in terms of data transfer rate and processor utilization.

(a) (5 pts) Programmed input/output

(b) (5 pts) Interrupt-device input/output

(c) (5 pts) Direct Memory Access

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1. Business opportunities impacted by the proliferation of new technologies (25 marks)
 - A. Sandra Ng (吳君如) has been well-known as an award-winning actress. However, in the 1990s she released five studio albums. Using the long-tail theory or otherwise, explain how the proliferation of Spotify, KKBox and other music streaming platforms may bring her additional income (10 marks).
 - B. Successful sharing economy platforms like Airbnb and Uber may have been established long ago (for example, before 2010). However, they were not gaining significant success until recent years. From the perspective of technology proliferation, explain why. (10 marks)
 - C. Explain how crowdfunding lowered the barriers to starting new businesses (5 marks)
2. Emotional labour is the process of managing feelings and expressions to fulfil the emotional requirements of a job. Workers are expected to regulate their emotions during interactions with customers, co-workers, clients and managers. This is done so as to produce a certain feeling in the customer or client that will allow the company or organization to succeed (25 marks)
 - A. Using your daily life experience and knowledge, explain to what extent the work of healthcare professionals involves the process of emotional labour. (10 marks)
 - B. During the pandemic of COVID-19, the healthcare systems in Taiwan (and many other countries) are under great stress. Explain how the process of emotional labour is impacted because of COVID-19. (5 marks)
 - C. How can emerging technologies mediate the issues which you mentioned in Part (B)? (10 marks)
3. Telemedicine (or telehealth) is the delivery of health-related services via information technologies. (25 marks)
 - A. Explain its advantages and issues to be considered during the implementation (5 marks)
 - B. Currently, it is widely proliferated in Australia, USA and some other countries but not Taiwan. Based on your opinion and knowledge, explain why. (10 marks)
 - C. Write a letter of 150 Chinese words to Dr. Hsueh Jui-yuan (薛瑞元), the Minister of Health and Welfare. Persuade him to implement a more relaxed policy regarding the implementation of telemedicine in Taiwan. (10 marks)
4. Porter's 5 force / Porter's Generic Strategies Analysis (15 marks)
 - A. Do a porter 5 force analysis for China Airlines. Focus on the Taiwanese market. (10 marks)
 - B. Explain one limitation of the 5 Force model. (5 marks)
5. Using your daily life experience and knowledge, explain the role of social media on mental health (10 marks)

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1. For physician fee in many hospitals, there are several ways to pay, like a. fixed salary system, b. guaranteed salary (保證薪) (generally used for doctors just being recruited to a hospital), c. fee-for-cases (論件計酬), and d. fee-for-quantity (論量計酬). What is the idea behind each of the above-mentioned physician fee payment ways? (20 points)

2. Since the epidemic coronavirus-19 can spread over the countries, the interchange of global patient record may be needed to alarm the border inspector to take some measures, like isolation, enforced checking, etc. to prevent the plague outbreaks. What the mechanisms are needed to achieve the interchange of global patient record, including the software and hardware. (20 points)

3. The following is the description of UD (Unit dose) for the inpatients in some hospital. The basic involved actors are pharmacy, medicine packing machine, nursing station, inpatient, and doctors. You can add some others if involved.

Normally, the UD, extracted from standing order, is packed and sent to nursing station once a day in the evening, covering one day's medicine from this evening to next evening for an inpatient. Several exceptional conditions may occur; one is that the doctor changes the order after the UD is packed (the UD-medicine is returned back and stat-medicine is dispatched instead); the second is that the inpatient is admitted but after the delivery time of UD; then a stat-order is served instead until the next UD comes; the third exception (in most hospitals) occurs when the date to deliver the UD is one day before a holiday. In such exception, the UD will be packed for several days to reduce the loading of dispatcher and pharmacists.

To adhere the patient safety, please find the possible errors (or malpractice) in the above three exception processes and their prevention mechanism against the possible errors. (20 points)

4. The payment system of NHI (National healthcare insurance) evolves from the fee-for-service to a variety of payment ways to face the increase of service costs, including a. case payment, b. Diagnosis related group (DRG), c. hospital-based budget (醫院總額), d. region-base budget (區域總額), e. global budget, f. fee-for-quality, g. reasonable outpatient amount (合理門診量). Please describe the target of the above payment ways that intends to enhance. (20 points)

5. The following indexes are listed in Taiwan Clinical Performance Indicator, TCPI. Suppose they go worse recently, how would you do to remedy them? (20 points)

- a. Unplanned return to intensive care unit (ICU) within 24 hours
- b. endotracheal tube (氣管) reinsertion rate within 24 hours
- c. infection in Surgical site

