

考試科目	個體經濟學	所別	研究所	考試時間	5月24日上午第一節 星期六
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國立政治大學圖書館

1. (20%) Let $f(x)$ be a production function that relates a single input to a single output. The output has a price of 1 and the input has a price of zero. If the firm chooses an input level x , a fraction $1-a$ of the input is unavoidably wasted. Thus the output resulting from a choice of x is $f(ax)$. (Both a and x are strictly positive).
- (6%) What is the first order condition for profit maximization?
 - (6%) What is the second order condition for maximization?
 - (4%) Let $x(a)$ be the optimal choice of x as a function of a . What is $x'(a)$?
 - (4%) What is the sign of $x'(a)$?

2. (30%) Consider a moral hazard insurance model. Let the consumer's von Neumann-Morgenstern utility of wealth be $u(w) = w^{1/2}$, let her initial wealth be $w_0 = \$100$, and suppose that there are but two loss levels, $L = 0$ and $L = \$51$. There are two effort levels, $e = 0$ and $e = 1$. The consumer's disutility of effort is given by the function $d(e)$, where $d(0) = 0$ and $d(1) = 1/3$. Finally, suppose that the loss probabilities are given by the following entries, where the rows correspond to effort and the columns to loss levels.

	L = 0	L = 51
e = 0	1/3	2/3
e = 1	2/3	1/3

So, for example, the probability that a loss of \$51 occurs when the consumer exerts high effort is 1/3.

- (10%) What effort level will the consumer exert if no insurance is available?
- (10%) Show that if information is symmetric, then it is optimal for the insurance company to offer a policy that induces high effort.
- (10%) Show that the policy in part (b) will not induce high effort if information is asymmetric.

備考	試題隨卷繳交
命題委員：	-46-
	(簽章) 九十二年五月九日

考試科目	個體經濟學	所別	經濟所	考試時間	5月24日上午第 節 星期六 下
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國立政治大學圖書館

Macroeconomic Theory

3. <Consumer Demand> Consider the following expenditure function

$$e(p, u) = \exp \left\{ \sum_k a_k \log p_k + \left(\prod_k p_k^{b_k} \right) u \right\}$$

- (a) Find the indirect utility function that corresponds to it. (10%)
 (b) Verify Roy's identity (5%) and the Slutsky equation (5%)

4. <Game Theory> Consider the following stage game

	C	D
C	$\frac{K}{2}, \frac{K}{2}$	0, K
D	K, 0	L, L

- (a) Let $K = -2$ and $L = 1$. (i) Find the set of pure strategy NE of the stage game (3%).
 (ii) Determine which equilibrium is risk dominant (5%).
 (iii) Check if there is any evolutionarily stable equilibrium (10%)
- (a) Let $K = 2$ and $L = \frac{1}{2}$.
 (i) Find the set of pure strategy NE of the stage game. (2%)
 (ii) If this stage game is repeatedly played infinitely and denote δ as the discount factor, find a subgame perfect equilibrium whose average payoff is $(\frac{3}{4}, \frac{3}{4})$ (10%)

備 考	試 題 隨 卷 繳 交
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命 題 委 員 : _____ (簽章) _____ 年 _____ 月 _____ 日

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考試科目	總體經濟學	所別	經濟所	考試時間	5月24日上午第一節 星期六
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1.

Economic Statistics of the Great Depression

YEAR	(1) GNP, 1992 \$, BILLIONS	(2) I/GNP, %	(3) G, 1992 \$, BILLIONS	(4) UN- EMPLOY- MENT RATE, %	(5) CPI, 1929 = 100	(6) COM- MERCIAL PAPER RATE, %	(7) AAA RATE, %	(8) STOCK MARKET INDEX*	(9) M1, 1929 = 100	(10) FULL- EMPLOY- MENT SURPLUS/Y*, % †
1929	938.1	17.8	121.9	3.2	100.0	5.9	4.7	83.1	100.0	-8
1930	850.2	13.5	133.0	8.7	97.4	3.6	4.6	67.2	96.2	-1.4
1931	784.9	9.0	137.7	15.9	88.7	2.6	4.6	43.6	89.4	-3.1
1932	676.1	3.5	131.2	23.6	79.7	2.7	5.0	22.1	78.0	-9
1933	662.1	3.8	127.6	24.9	75.4	1.7	4.5	28.6	73.5	1.6
1934	713.7	5.5	145.2	21.7	78.0	1.0	4.0	31.4	81.4	.2
1935	777.4	9.2	148.5	20.1	80.1	.8	3.6	33.9	96.6	-1
1936	882.7	10.9	174.4	16.9	80.9	.8	3.2	49.4	110.6	-1.1
1937	923.5	12.8	167.8	14.3	83.3	.9	3.3	49.2	114.8	1.8
1938	885.7	8.1	182.7	19.0	82.3	.8	3.2	36.7	115.9	.6
1939	953.0	10.5	190.2	17.2	81.0	.6	3.0	38.5	127.3	-1

*Stock market index is Standard & Poor's composite index, which includes 500 stocks; September 1929 = 100.
†Y* denotes full-employment output.

Source: Cols. 1, 2, 3: U.S. Department of Commerce, *The National Income and Product Accounts of the United States, 1929-1974*. Col. 4: Revised Bureau of Labor Statistics data taken from Michael Darby, "Three-and-a-Half Million U.S. Employees Have Been Mislead: Or, an Explanation of Unemployment, 1934-1941," *Journal of Political Economy*, February 1976. Cols. 5, 6, 7: *Economic Report of the President, 1957*. Col. 8: Standard & Poor's Statistical Service, *Security Price Index Record, 1978*. Col. 9: Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1867-1960* (Princeton, NJ: Princeton University Press, 1963), table A1, col. 7. Col. 10: E. Cary Brown, "Fiscal Policy in the Thirties: A Reappraisal," *American Economic Review*, December 1956, table 1, cols. 3, 5, and 19.

上表為美國「大蕭條(Great Depression)」的相關資料，試據以描述「大蕭條」時期的經濟特徵，並回答下列問題：

- (1) 凱因斯論者(Keynesians)認為「大蕭條」的原因及相應對策為何？
- (2) 貨幣論者(monetarists)認為「大蕭條」的原因及相應對策為何？
- (3) 前述兩派論者的見解是否互相排斥？為什麼？
- (4) 「大蕭條」的史實對經濟學者有何啟示？

(25%)

2. 設想有一個開放經濟體(open economy)，其物價固定不變，而國際資本完全移動，請分別就浮動匯率與固定匯率的情況，比較分析下列問題：

- (1) 若此經濟體為小國，政府減稅對本國產出、經常帳、資本帳及匯率（若匯率可變）的影響。
- (2) 若此經濟體為大國，而非小國，則本國政府減稅對本國及外國產出的影響。
- (3) 試比較(1)及(2)的結果，並據以引伸分析結果的政策涵義(policy implications)。

(25%)

備考	試題隨卷繳交
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命題委員： -48- (簽章) 2003年5月8日

國立政治大學圖書館

考試科目	總體經濟學	所別	經濟學系	考試時間	5月24日 上午 星期六 ①	第 節
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國立政治大學圖書館

3. 請問您對於中央銀行應採取控制利率或控制貨幣供給政策之看法及其背後理由，並分析人們預期 (expectations) 行為的改變對央行之最適政策有何影響？

4. 試敘述造成通貨膨脹 (inflation) 的可能因素，目前我國與日本以及香港是面臨通貨膨脹或是通貨緊縮 (deflation) 的問題？請問您認為造成該現象的原因以及政府應採取何種政策因應該問題？

備	考	試	題	隨	卷	繳	交
命題委員：				-49-			
				(簽章) 92年 5月 12日			

考試科目	統計學	所別	經濟所	考試時間	5月24日上午第 節 星期六 (下)
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國立政治大學圖書館

1. (5分) 請解釋 Chebyshev's 不等式:

$$P(|X - \mu| \geq k) \leq \frac{\text{Var}(X)}{k^2}$$

的意義及用途。

2. (15分) 請根據變異數的定義

$$\text{Var}(X) = E[(X - \mu)^2],$$

解釋為什麼變異數可以描述隨機變數 X 之分配的「離散狀態」。請再解釋為什麼三階動差

$$E[(X - \mu)^3],$$

可以描述隨機變數 X 之分配的「偏態」(skewness)。最後請解釋四階動差可以描述隨機變數 X 之分配的什麼特性, 請解釋。

3. (15分) 給定兩個隨機變數 X 和 Y , 請寫出條件期望值 $E(Y|X)$ 條件變異數 $\text{Var}(Y|X)$ 的定義, 並解釋它們描述的是什麼分配的什麼特性。請證明

$$\text{Var}(Y) = E[\text{Var}(Y|X)] + \text{Var}[E(Y|X)].$$

並請解釋由之導出之不等式

$$\text{Var}(Y) \geq \text{Var}[E(Y|X)]$$

的意義。

4. (10分) 「多項分配」(multinomial distribution) 大概是一個最有名的多變量離散型 (discrete) 隨機變數之分配, 它的密度函數是

$$f(x_1, \dots, x_{k-1}) = \frac{n!}{x_1! x_2! \dots x_k!} p_1^{x_1} p_2^{x_2} \dots p_k^{x_k},$$

這裡 $n = 1, 2, \dots, p_j \in [0, 1], p_k = 1 - p_1 - \dots - p_{k-1}$ 和 $x_k = n - x_1 - \dots - x_{k-1}$. 請舉例說明什麼樣的經濟變數在一起可能會有多項分配。同樣的 Poisson 分配的密度函數是

$$f(x) = \frac{e^{-\mu} \mu^x}{x!}, \quad x = 0, 1, 2, \dots$$

這裡 $\mu > 0$ 。請舉例說明什麼樣的經濟變數可能會有多項分配。

5. (15分) 請解釋卡方分配、t 分配、以及 F 分配和常態分配的關係。

備 考 試 題 隨 卷 繳 交

命 題 委 員:

-50-

(簽章) 92年 5月 12日

考試科目	統計學	所別	經濟所	考試時間	月 日 上 星期 下 午 第 節
<p>6. (10分) 假設 X 是 $\mathcal{N}(\mu, \sigma^2)$, 請問 $Y = \exp(X)$ 是什麼分配, Y 的密度函數要如何從 X 的密度函數推導而出?</p> <p>7. (10分) 如果 X_n 和 X 的期望值存在, 且</p> $E(X_n - X)^2 \rightarrow 0,$ <p>則我們說 X_n 以 mean square 形式收斂到 X:</p> $X_n \xrightarrow{\text{m.s.}} X.$ <p>請證明如果 $E(X_n) \rightarrow \mu$ 和 $\text{Var}(X_n) \rightarrow 0$, 則 $X_n \xrightarrow{\text{m.s.}} \mu$.</p> <p>8. (20分) 考慮以下的概似函數:</p> $L(\mu_1, \mu_2, \sigma^2) = -\frac{n}{2} \log(2\pi) - \frac{n}{2} \log(\sigma^2) - \frac{1}{2\sigma^2} \left[\sum_{i=1}^k (z_i - \mu_1)^2 + \sum_{i=k+1}^n (z_i - \mu_2)^2 \right],$ <p>其中 z_i 為觀察值, n 為觀察值的數目.</p> <p>(1) 請計算 μ_1, μ_2, 和 σ^2 的最大概似估計式 (MLE).</p> <p>(2) 請說明如何檢定 $\mu_1 = \mu_2$?</p>					
備 考	試題隨卷繳交				
命題委員:	-51- (簽章) 92年5月12日				

國立政治大學圖書館

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考試科目	數學	所別	經濟	考試時間	5月24日 星期六	下午第三節
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國立政治大學圖書館

NOTE: Answer TWO Questions from Q1 to Q4; TWO Questions from Q5 to Q8; ONE questions from Q9 to Q10 (20% for each). Only THE BEST FIVE answers will be counted. Thus, try your best to finish each question you choose rather than answer too many questions.

(Answer TWO Questions from Q1 to Q4)

Q1. Compute

$$\int_1^b \left(\int_1^d \frac{y-x}{(y+x)^3} dy \right) dx,$$

where b and d are constants > 1 .

Q2. Find the characteristic roots of the matrices:

(i) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$; (ii) $\begin{bmatrix} 5 & -2 & -2 \\ -2 & 2 & -4 \\ -2 & -4 & 2 \end{bmatrix}$; (iii) $\begin{bmatrix} 1 & 2 & 2 \\ 0 & 2 & 1 \\ -1 & 2 & 2 \end{bmatrix}$.

Q3. Solve the maximum AND minimum problem

$$\max \text{ (and min) } f(x, y) = x^2 + y^2$$

$$\text{subject to } g(x, y) = x^2 + xy + y^2 = 3.$$

Q4. Perform a phase plane analysis of the system

$$\dot{x} = x(k - ay), \quad \dot{y} = y(-h + bx),$$

where a, b, h and k are positive constants. Find the equilibrium points.

備考 試題隨卷繳交

命題委員：

-52-

(簽章) 92年 5月14日

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考試科目	數學	所別	經濟	考試時間	5月24日 星期六 下午第二節
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國立政治大學圖書館

(Answer TWO Questions from Q5 to Q8)

Q5. Suppose that $f(x_1, \dots, x_N)$ is homogeneous of degree r (for $r = \dots, -1, 0, 1, \dots$) and differentiable. Prove

(i) for any $n = 1, \dots, N$, the partial derivative function $\partial f(x_1, \dots, x_N) / \partial x_n$ is homogeneous of degree $r - 1$;

(ii) at any $(\bar{x}_1, \dots, \bar{x}_N)$, we have

$$\sum_{n=1}^N \frac{\partial f(\bar{x}_1, \dots, \bar{x}_N)}{\partial x_n} \bar{x}_n = r f(\bar{x}_1, \dots, \bar{x}_N)$$

or in matrix notation, $\nabla f(\bar{x}) \cdot \bar{x} = r f(\bar{x})$.

Q6. (Separating Hyperplane Theorem) Suppose that $B \subset R^N$ is convex and closed, and that $x \notin B$, then there is $p \in R^N$ with $p \neq 0$ and a value $c \in R$ such that $p \cdot x > c$ and $p \cdot y < c$ for every $y \in B$.

Q7. 3. In Rubinstein's infinite-horizon bargaining game, two players bargain to split v dollars. The game begins in period 1; in period 1, player 1 makes an offer of a split (a real number between 0 and v) to player 2, which player 2 may accept or reject. If she accepts, the proposed split is immediately implemented and the game ends. If she rejects, nothing happens until period 2. In period 2, player 2 makes an offer to player 1 and player then may accept or reject it, and so on. Suppose the players have discount factors: δ_1 for player 1 and δ_2 for player 2. Show that in the backwards-induction outcome, player 1 offers the settlement

$$\left(\frac{1 - \delta_2}{1 - \delta_1 \delta_2}, \frac{\delta_2(1 - \delta_1)}{1 - \delta_1 \delta_2} \right)$$

to player 2, who accepts.

Q8. Given $A \subset R^N$ and the closed set $Y \subset R^K$, suppose that $f : A \rightarrow Y$ is a single-valued correspondence (so that it is, in fact, a function). Then $f(\cdot)$ is an upper hemicontinuous correspondence if and only if it is continuous as a function.

備 考 試 題 隨 卷 繳 交

命 題 委 員 :

-53-

(發章) 92年5月4日

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考試科目	數學	所別	經濟	考試時間	5月26日 星期六 下午第二節
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(Answer ONE Question from Q9 to Q10)

Q9. Suppose that $z(p)$ is a function defined for all nonzero, nonnegative price vectors $p \in R_+^L$ and satisfies the properties:

- (i) $z(\cdot)$ is continuous.
- (ii) $z(\cdot)$ is homogeneous of degree zero.
- (iii) $p \cdot z(\cdot) = 0$ for all p (Walras' law).

Then there is a price vector p^* such that $z(\cdot) \leq 0$.

Q10. Consider the system

$$(*) \quad \dot{p}_1 = f_1(p_1, \dots, p_N), \dots, \dot{p}_N = f_N(p_1, \dots, p_N)$$

and assume that

$$(i) \quad \sum_{n=1}^N p_n f_n(p_1, \dots, p_N) = 0 \text{ for all } (p_1, \dots, p_N),$$

$$(ii) \quad \sum_{n=1}^N p_n^0 f_n(p_1, \dots, p_N) > 0 \text{ for all } (p_1, \dots, p_N) \neq (p_1^0, \dots, p_N^0),$$

where $p^0 = (p_1^0, \dots, p_N^0)$ is an equilibrium state for system (*). Prove that p^0 is asymptotically stable.

國立政治大學圖書館

備考	試題隨卷繳交
命題委員：	-54-
	(簽章) 92年5月14日

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考試科目	經濟史	所別	經濟學系	考試時間	月 星期	日 上下	第 節
<p>1、試以晚清的茶、糖、樟腦及日治時期的米、糖貿易，戰後的加工出口為例，說明台灣的對外貿易與區域經濟分工的演變。</p> <p>2、試比較1930年代、1940年代後期、1970年代台灣歷次通貨膨脹的形成原因、對策及其影響。</p> <p>3、試說明從清代到戰後台灣專賣制度的演變及其財政意義與所得分配的影響。</p> <p>4、試闡述民間文書契約和政府檔案等史料對於台灣經濟史研究的意義，並各舉一例說明之。</p>							
備考	試題隨卷繳交						
命題委員：	-55- (簽章) 92年5月13日						

國立政治大學圖書館

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考試科目	計算機概論	所別	經濟系	考試時間	月	日	上	午	第	節
					星期		下			

一、選擇題 (90%)

1. The CPU contains _____.
 - a. input devices and output devices
 - b. the control unit and the arithmetic/logic unit
 - c. main memory and storage devices
 - d. all of the above
2. _____ is the process of obtaining a program instruction or data item from memory.
 - a. Fetching
 - b. Storing
 - c. Decoding
 - d. Executing
3. A _____ is equal to approximately one million bytes.
 - a. dekabyte (abbreviated DB or D)
 - b. centibyte (abbreviated CB)
 - c. kilobyte (abbreviated KB or K)
 - d. megabyte (abbreviated MB)
4. Most _____ is volatile; it loses its contents when the power is removed from the computer.
 - a. RAM
 - b. CMOS
 - c. ROM
 - d. all of the above
5. A universal serial bus (USB) port _____.
 - a. is a special type of serial port that connects the system unit to a musical instrument
 - b. can connect up to 127 different peripheral devices with a single connector type
 - c. is a special high-speed parallel port used to attach peripheral devices
 - d. allows wireless devices to transmit signals to a computer via infrared light waves
6. The program development life cycle (PDLC) consists of six steps: _____.
 - a. analyze problem, design programs, code programs, support programs, formalize solution, maintain programs
 - b. plan problem, design programs, code programs, test programs, formalize solution, maintain programs
 - c. analyze problem, design programs, code programs, test programs, formalize solution, implement programs
 - d. analyze problem, design programs, code programs, test programs, formalize solution, maintain programs
7. In the PDLC, the analysis step consists of all of the following major tasks except _____.
 - a. test the solution algorithm
 - b. review the program specifications package
 - c. meet with the systems analyst and users
 - d. identify each program's input, output, and processing components
8. _____ languages are low-level languages.
 - a. Machine and assembly
 - b. Assembly and third-generation
 - c. Third-generation and fourth-generation
 - d. Fourth-generation and fifth-generation

國立政治大學圖書館

備 考 試 題 隨 卷 繳 交

命 題 委 員 :

- 56 -

(簽 章) 92 年 5 月 12 日

考試科目	計算機概論	所別	經濟系	考試時間	月	日	上午	第	節
					星期	下			

9. To convert an assembly language source program into machine language, a(n) _____ is used.
 - a. assembler
 - b. forecaster
 - c. compiler
 - d. interpreter
10. With the object-oriented (OO) approach, an object encapsulates, or _____ a programmer.
 - a. carries out, the details of an object for
 - b. hides, the details of an object from
 - c. reveals, the details of an object to
 - d. extends, the details of an object beyond
11. A specific occurrence of an object or object class is called a(n) _____.
 - a. object instance
 - b. object message
 - c. object inheritance
 - d. object event
12. An applet _____
 - a. is an interpreted program that runs on the client
 - b. tracks the number of visitors to a Web site
 - c. is a compiled program that usually runs on the client
 - d. collects data from visitors to a Web site
13. A script _____
 - a. is an interpreted program that runs on the client
 - b. tracks the number of visitors to a Web site
 - c. is a compiled program that usually runs on the client
 - d. collects data from visitors to a Web site
14. _____ is an interpreted scripting language that allows functionality to be added to a Web page by inserting code within an HTML document.
 - a. Java
 - b. JavaScript
 - c. Perl
 - d. PerlScript
15. In most cases, the operating system resides on the computer's _____.
 - a. tape cartridge
 - b. floppy disk
 - c. compact disc
 - d. hard disk
16. A(n) _____ is a small image that represents a program, an instruction, a file, or some other object.
 - a. keyword
 - b. interface
 - c. menu
 - d. icon
17. A multitasking operating system _____
 - a. allows only one user to run one program at a time
 - b. enables two or more users to run a program simultaneously
 - c. allows a single user to work on two or more applications at the same time
 - d. can support two or more processors running programs at the same time

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CN Page 2 Version 1

備	考	試	題	隨	卷	繳	交
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考試科目	計算機概論	所別	經濟系	考試時間	5月24日上午第 星期六下午第節
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18. The purpose of memory management is to _____.
- optimize use of random access memory (RAM)
 - determine the order in which jobs are processed
 - perform functions related to storage and file management
 - provide a means to establish Web connections
19. A(n) _____ organizes and coordinates how multiple users access and share resources on a network.
- stand-alone OS
 - network OS
 - embedded OS
 - registered OS
20. A _____ is a utility that reorganizes the files and unused space on a computer's hard disk so the operating system can access data more quickly and programs can run faster.
- disk defragmenter
 - file viewer
 - disk scanner
 - file compression utility
21. A consistency check _____.
- ensures that only the correct data type is entered into a field
 - verifies that all required data is present
 - determines whether a number is within a specified limit
 - tests if the data in two or more associated fields is logical
22. Two major weaknesses of a file processing system are _____.
- scarce data and integrated data
 - scarce data and isolated data
 - redundant data and integrated data
 - redundant data and isolated data
23. Three popular data models in use today are _____.
- hierarchical, network, and relational
 - network, relational, and object-oriented
 - relational, object-oriented, and multidimensional
 - object-oriented, multidimensional, and hierarchical
24. Two advantages of object-oriented databases, relative to relational databases, is that they can _____.
- access data faster and use Structured Query Language (SQL)
 - use Structured Query Language (SQL) and store associations among data
 - store associations among data and store more data
 - store more types of data and access data faster
25. Some _____ have their own query languages, statistical analysis, spreadsheets, and graphics that help users retrieve data and analyze the results.
- TPSs (transaction processing systems)
 - DSSs (decision support systems)
 - MISs (management information systems)
 - OISs (office information systems)
26. Expert systems consist of two main components: _____.
- a check digit and before images
 - a default value and validation rules
 - relational algebra and report generators
 - a knowledge base and inference rules

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備 考 試 題 隨 卷 繳 交

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國立政治大學圖書館

27. For successful communications, a _____ is needed that initiates an instruction to transmit data, instructions, or information.
- sending device
 - communications device
 - communications channel
 - receiving device
28. _____ is a LAN technology that controls access to the network by requiring that network devices share or pass a special signal.
- TCP/IP
 - Ethernet
 - WAP
 - Token ring
29. A Home RF (radio frequency) network _____.
- uses radio waves, instead of cable, to transmit data
 - is a network that uses the same lines that bring electricity and power into the home
 - requires a separate cable to connect to each computer in the home
 - is an inexpensive network that uses existing telephone lines in the home
30. When compared to cables that use wire, such as twisted-pair and coaxial cables, all of the following are advantages of fiber-optic cables except _____.
- less susceptibility to noise (interference) from other devices
 - faster data transmission
 - less cost and easier installation and modification
 - better security for signals during transmission

二、問答題 (10%)

1. Please list the following media in order, from slower to faster:

Tape, Compact disk, Hard disk, Floppy disk, RAM

2. What are the four operations comprise a machine cycle?

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