國立雲林科技大學
95 學年度碩士班入學招生考試試題

系所：資管系
科目：資訊管理導論

一、選擇題(40%)

1. Which of the following statements regarding security of information systems is not correct?
a) Technology can compensate for poor security management practices.
b) Effective security begins with organizational control systems that treat information as a valuable asset.
c) No technology will prevent unauthorized access to records accessible by your suppliers if your suppliers permit their systems to be hacked.
d) Effective security demands a security policy that addresses proper security practices and methods of enforcing those practices.

2. Which of the following includes top business mangers, selected users, IS mangers, and technical specialists who provide direction and vision about the use and development of the IS infrastructure.
a) architecture committee
b) infrastructure committee
c) systems committee
d) steering committee

3. Which of the following lists the stages of the systems development life cycle in the correct order:
a) needs assessment, design, alternative analysis, development, implementation, and maintenance
b) needs assessment, alternative analysis, design, development, implementation, and maintenance
c) alternative analysis, needs assessment, design, implementation, development, and maintenance
d) needs assessment, alternative analysis, development, design, implementation, and maintenance

4. Which of the following statements about why systems succeed or fail is not correct?
a) Every project involves some element of risk.
b) Successful project have a broadly defined, generic scope.
c) Projects more often succeed when experienced and effective managers run them.
d) Systems development requires time, money, and people.

5. A combination of processes and tools for increasing a business's competitive advantage by using data intelligently to make better, faster decisions is
a) competitive intelligence.
b) knowledge management.
c) competitive advantage.
d) business intelligence.

6. The use of software to extract previously unknown, unsuspected, and potentially useful information from data is
a) knowledge mining.
b) data management.
c) data mining.
d) data analysis.

7. Producing the exact product that each customer wants as cheaply and efficiently as if it were mass-produced is a concept known as
a) custom production.
b) mass production.
c) mass customization.
d) computer-aided mass production.

8. The process of getting different software packages to work together as an integrated whole is called
a) enterprise application integration.
b) enterprise software tooling.
c) computer integrated software.
d) middleware.

9. The ability of a producer to do electronic commerce anywhere gives it the ability to bypass wholesalers and/or retailers in its demand chain. This process is called
a) disintermediation.
b) intermediation.
c) aggregation.
d) reintermediation.

10. Software that accepts commands over the Web and optionally returns results over the Web is a(n)
a) Web form.
b) Web service.
c) EDI.
d) XML.

11. Which of the following connects two or more computers, hubs, sub-networks, or networks that have compatible standards for sending signals over transmission media and hardware and creating and ensuring the correct order of sessions?
a) Switch
b) Hub
c) Router
d) Gateway

12. Which of the following statements regarding networks is incorrect?
a) Computer networks help employees communicate across functional areas.
b) Networks help keep business running smoothly and efficiently.
c) Networks help managers and employees throughout their company coordinate activities.
d) Although networks are more expensive than their return on investment, corporations continue to use them.

13. An enterprise-wide database, containing summarized and aggregate data, designed to support business intelligence and management decision making rather than operational needs is a
a) database management system
b) data mining house
c) data warehouse
d) data mart

14. Which standard allows application programs to access databases through a DBMS in a uniform way?
a) Uniform DBMS standard
b) Open Database Connectivity (ODBC) standard
c) XML database standard
d) Extract Transform Load (ETL) standard

15. A virtual storage device created by connecting different types of storage devices, such as tape libraries, RAID disks, and optical jukeboxes, over a high speed network is a(n)
a) storage subsystem.
b) storage area network (SAN).
c) RAID system.
d) general purpose network (GPN).

16. The three-tier client/server model divides an application into
a) multiple components, each of which can call on the others to perform services for it.
b) the client, the server, and the network.
c) the user interface, business logic, and data-handling components.
d) multiple components, each of which is independent of the others.

17. Flattening the organizational structure
a) decreases managers' span of control and moves decision making further from the source of information.
b) increases managers' span of control and moves decision making further from the source of information.
c) decreases managers' span of control and moves decision making closer to the source of information.
d) increases managers' span of control and moves decision making closer to the source of information.

18. Which of the following statements about using information to achieve a competitive advantage is incorrect?
a) A firm that can respond quickly to market conditions has an advantage over its slower competitors.
b) Good service is not a requirement of business in many industries.
c) An organization can create a competitive advantage by becoming a low-cost producer.
d) Having a reputation for quality offers a strategic advantage for any organization.

19. Which of the following systems assist managers in making non-routine decisions?
a) Decision support systems
b) Database management systems
c) Groupware
d) Transaction processing systems

20. Which of the following types of information systems fully integrates the functions of a company or enterprise and provides a single, comprehensive repository for its information?
a) Individual information system
b) Functional information system
c) Enterprise information system
d) Inter-organizational information system

國立雲林科技大學
95學年度碩士班入學招生考試試題

系所：資管系
科目：資訊管理導論

二、問答題(60%)

1. What can business units mangers do about performance problems in the use of information technology and the development and operation of information systems in their business units?(10%)
2. Suppose you are an analyst working for a small company to develop an accounting system. Would you use the Unified Process to develop the system, or would you prefer the traditional approaches? Why? (20%)
3. Suppose you work in the IT department of 7x24 Hotels, a multinational hotel chain. 7x24 Hotels runs several specialized business support systems, including a guest reservations system that was developed in-house to meet the requirements of a large company with worldwide operations. Guests can make one-stop online reservations by visiting 7x24's Web site, which has links to all major travel industry sites. 7x24 Hotels just acquired Mayflower's, a regional chain of 20 motels in Taiwan. Mayflower's uses a vertical reservations package suitable for small- to medium-sized businesses, and a generic accounting and finance package. Should Mayflower's use 7x24 Hotels' information systems or continue with its own? In your answer, consider issues such as business profiles, business processes, system interactivity, EDI, XML, e-commerce, and the characteristics of both information systems. What additional information would be helpful to you in making a recommendation? (30%)

國立雲林科技大學
95學年度碩士班入學招生考試試題

系所：資管系
科目：計算機概論 (乙)

第一部分

1. 在Web-Based程式設計中，有Cookie及Session等兩種機制，何謂Cookie？何謂 Session？試問此兩種機制有何不同呢？它們又可以應用在哪些方面呢？ (10%)

2. 何謂 Reliable Protocols 與 Unreliable Protocols？何謂 Connection-Oriented Protocols 與 Connectionless Protocols？試說明HTTP、TCP及IP等通訊協定分別屬於哪兩種？ (10%)

3. 何謂 semaphore？它主要是解決哪種問題的？何謂 counting semaphore？何謂binary semaphore？試問 counting semaphore 及 binary semaphore 可以應用在哪裡？ (10%)

4. 結構化系統分析(Structured Systems Analysis)主要的步驟有哪些？在各步驟中分析結果會產生哪些文件？另外，物件導向系統分析(Object-Oriented Analysis) 主要的步驟有哪些？在各步驟中分析結果又會產生哪些文件？ (10%)

5. 試利用任何一種程式語言(需註明所使用的語言)，分別以遞迴(recursion)及非遞迴(non-recursion)方式，寫出計算下列Fibonacci數列的函數。(10%)

$$F_0 = 1,\ F_1 = 2,\ F_{i+1} = F_i + F_{i-1} \quad 當\ i = 1, 2, \cdots$$

第二部分（單選題，每題2分，共50分）

1. When defining the *greatest common divisor* (GCD) of two positive integers *recursively*, if the BASIS part is "If j divides i evenly, then j is the GCD of i and j", what should the INDUCTION part be?
   (a) *gcd*(i, j) is the smallest positive integer k which can be written in the form $k = i \times p + j \times q$ where p and q are integers.
   (b) *gcd*(i, j) is the product of the overlapping primes of the *prime factorizations* of i and j.
   (c) If k is the *least common multiple* (LCM) of i and j, then *gcd*(i, j) is the same as $i \times j / k$.
   (d) If j does not divide i evenly, let k be the remainder when i is divided by j. Then *gcd*(i, j) is the same as *gcd*(j, k).

2. Which one of the following statements about binary trees is true?
   (a) Binary trees are trees all of whose nodes have two or fewer children.
   (b) Tries are binary trees.
   (c) A subtree of a binary tree is itself a binary tree.
   (d) Arithmetic expressions are representable by binary search trees.

3. Which one of the following statements about lists is ***false***?
   (a) A sublist of list L is also a subsequence of L.
   (b) A subsequence of list L is also a sublist of L.
   (c) A prefix of list L is also a sublist of L.
   (d) A suffix of list L is also a subsequence of L.

4. Which one of the following binary relations is a total order?
   (a) $\leq$ on integers
   (b) $<$ on integers
   (c) $\subseteq$ on 2^U for some universal set U
   (d) $\subset$ on 2^U for some universal set U

5. Suppose L is the language containing all strings of 0's and 1's such that every pair of adjacent 0's appears before any pair of adjacent 1's. Which one of the following is a regular expression for L?
   (a) (ε+1)(01)* (ε+0)
   (b) (ε+0)(10)* (ε+1)
   (c) (01+1)*(10+0)*(ε+1)
   (d) (10+0)*(01+1)*(ε+0)

6. Consider the following XML document:

```
<order      xmlns="http://example.org/ord"
            xmlns:prod="http://example.org/prod">
  <items>
    <prod:product>
      <prod:number xmlns:prod="http://example.org/prod2">
        557
      </prod:number>
      <prod:size system="US-DRESS">10</prod:size>
    </prod:product>
  </items>
</order>
```

   What namespace is the ***number*** element in?
   (a) http://example.org/ord
   (b) http://example.org/prod
   (c) http://example.org/prod2
   (d) The ***number*** element is not in any namespace.

7. Which one of the following is not a built-in simple type of XML Schema?
   (a) base64Binary (b) anyType
   (c) NCName (d) gMonthDay

8. Which one of the following XML Schema elements can ***not*** be used to include other schema documents?
   (a) extension (b) include
   (c) import (d) redefine

9. Which one of the following technologies is ***not*** directly relevant to the Web Services Architecture?
   (a) WSDL (b) XML

(c) SOAP (d) RSVP

10. Which one of the following is ***not*** considered a programming paradigm?
(a) functional programming (b) scalar programming
(c) contingency programming (d) subject-oriented programming

11. Which one of the following programming languages is ***not*** in the C programming language family?
(a) Java (b) ML
(c) C++ (d) C#

12. Which one of the following is a version control system?
(a) CVS (b) Maven
(c) Ant (d) Cocoon

13. Which one of the following is ***not*** a UML diagram?
(a) deployment diagram (b) activity diagram
(c) component diagram (d) dataflow diagram

14. Consider the following description of a test:
A human judge engages in a natural language conversation with two other parties, one a human and the other a machine; if the judge cannot reliably tell which is which, then the machine is said to pass the test.
What is the name of the test?
(a) Intelligence test (b) Delta test
(c) Turing test (d) Brain test

15. Which one of the following is a variable-width Unicode encoding?
(a) UCS-2 (b) UTF-16
(c) UCS-4 (d) UTF-32

16. Let R be a relation schema, F be the set of functional dependencies given to hold over R, X be a subset of the attributes of R, and A be an attribute of R. In order for R to be in third normal form, every functional dependency in F of the form $X \rightarrow A$ must satisfy certain requirements. Which one of the following is ***not*** one of these requirements?
(a) A is a foreign key (b) X is a superkey
(c) A is part of some key for R (d) $A \in X$

17. Consider the presumption that what is not currently known to be true is false. What is the name of this presumption?
(a) general truth assumption (b) completeness assumption
(c) validity assumption (d) closed world assumption

18. The process of mapping an entity-relationship model to a relational model is referred to as
(a) conceptual design (b) relational design
(c) logical design (d) functional design

19. Which one of the following is ***not*** a key property of transactions?
(a) atomicity (b) cumulativeness

(c) isolation (d) durability

20. Consider the property that ensures that no records in a relational database are duplicated and that no attributes that make up the primary key are NULL. What is the name of this property?
(a) entity integrity (b) uniqueness constraint
(c) consistency integrity (d) lossless constraint

21. What is the purpose of the Internet top-level domain .arpa?
(a) country code (b) generic
(c) pseudo-domain (d) Internet-infrastructure

22. Consider a physical infrastructure that allows different Internet Service Providers (ISPs) to exchange Internet traffic between their networks (autonomous systems) by means of mutual peering agreements. What is the name of such a physical infrastructure?
(a) Internet Switching Point (b) Internet Access Point
(c) Internet Exchange Point (d) Internet Routing Point

23. What is the scheme used by TCP to achieve congestion avoidance?
(a) cyclic-redundancy-check
(b) additive-increase-multiplicative-decrease
(c) maximum-transmission-unit
(d) four-way-handshake

24. What is the algorithm used by routers in Internet Protocol (IP) networking to select an entry from a routing table?
(a) longest prefix match (b) shortest path first
(c) least cost selection (d) load sharing algorithm

25. Consider the protocol for finding a host's MAC address when only its IP address is known. What is the name of the protocol?
(a) NNTP (b) RTP
(c) SIP (d) ARP

國立雲林科技大學
95學年度碩士班入學招生考試試題

系所：資管系
科目：資訊管理實務

一、解釋名詞(10%)

a. U臺灣
b. VoIP
c. KPI
d. MCommerce
e. IS Literacy

二、問答與申論題

1. 請舉例說明重要的「企業流程」(Business processes)、「跨功能企業流程」(Cross-Functional Business Processes)、「跨組織企業流程」(Inter-Organizational Business Processes)與代表性的相關資訊系統。(10%)
2. 請定義「策略資訊系統」(Strategic Information Systems)，並舉例說明「事業層級」(Business-Level)、「公司層級」(Corporate-Level)與「產業層級」(Industry-Level)的主要競爭策略(Competitive Strategies)。(10%)
3. 請分析網際網路技術對於「資訊經濟」(Economics of Information)與經營模式(Business Models)的衝擊。(10%)
4. 請說明資訊科技可以有效改善數位化公司管理決策制定(Managerial Decision-Making)品質之道。(10%)
5. 請說明資訊系統開發專案中，影響風險的主要構面及其可行因應之道。(10%)
6. 試規納下列連續數字的規則（10%）
   a. 1、9、25、49、81.....，計算出第二十個數字的值。
   b. 2、6、12、20、30、42.....，計算出第四十個數字的值。
7. 由於資訊與通訊技術的持續進步，讓世界的經濟體系由傳統快速邁向數位經濟(Digital Economy)時代。數位經濟比傳統經濟法則更強調資訊、知識、品質與速度，企業經營益漸重視將資源投注在資訊與知識密集的企業活動，並運用網路與通訊技術將資訊及知識以數位化的形式創造、傳遞及儲存，並與顧客及合作夥伴間形成緊密之合作關係，以提昇整體產業供應鏈之競爭力。試建構企業所欲導入先進資訊系統(如ERP、SCM、KM、CRM等)的評估模式並加以詮釋？(30%)

國立雲林科技大學
95學年度碩士班招生入學考試試題

系所名：資訊管理系
科　目：教育概論與實務

一、名辭解釋(10 分, 每題 5 分)

1. 遠距教學

2. Big6 技能

二、問答題(40 分, 每題 20 分)

1. 試述「數位學習國家型科技計畫」的基本理念，以及落實在您教學或行政工作的具體作法。

2. 試述中小學九年一貫課程或高中職實施新課程的理念，以及對學校本位課程或教學的影響情形。

三、申論題：以下三題任選其中兩題作答即可（三題均作答者，則以最先出現的兩題作答內容為評分依據）：(50 分, 每題 25 分)

1. 大考中心在 95 年 2 月 6 日公佈九十五學年大學學科能力測驗國文、英文非選擇題評分原則，其中，最受關注的「火星文」語文修正考題決定不送分。姑且不論這類考題是否對高中語文教學有負面影響，請依據評量的原理原則評論：大考學測，乃至於學校內的語文考試或是各層級的入學測驗，火星文或是流行語彙該出現在考題中嗎？

2. 94 年 2 月 5 日教育部公佈「職業學校群科課程暫行綱要暨設備標準」，將現行 78 科整合為 15 群，且即將於 95 學年度開始實施。請問該暫綱中，有些什麼特別規劃可以讓高職學校發展各自的特色？其內涵為何？

3. 台灣省教育會等十多個團體發起的教改總體檢討論壇，在今年二月中旬舉辦「九年一貫與課程改革」的研討會，與會人士批評九年一貫課程的基礎理論與架構都有問題，不但未經過公共論述，也違反基本心理學、教育學原理，因此部分學者甚至建議廢除九年一貫課程。請就您的觀點評述九年一貫課程實施至今有那些正負面的效應或成果？

國立雲林科技大學
95學年度碩士班入學招生考試試題

系所：資管系
科目：計算機概論 (甲)

一、是非題：(20%，答案請採橫式書寫，每行五題)

1. ____ With XML, a server keeps an entire record from the client, preventing the client from doing much of the processing without going back to the server.

2. ____ A decision support system is often used to access and analyze data in a company transaction processing system.

3. ____ For a 3GLs, programmers typically use either a compiler or an interpreter to translate the 3GL source program into machine language instructions.

4. ____ With online transaction processing (OLTP), the computer collects data over time and processes all transactions later, as a group.

5. ____ A RAID system duplicated data, instructions, and information to improve data reliability.

6. ____ Dynamic RAM (DRAM) must be refreshed frequently.

7. ____ If a LAN uses TCP/IP protocols, it requires a gateway to connect to the Internet.

8. ____ Heuristic offers a good chance of finding a solution, though not necessarily the best one.

9. ____ OLE allows users to cut data from one type of application and paste to another without losing the formatting.

10. ____ Visual programming languages seldom are used in a RAD environment.

【下頁尚有試題】

國立雲林科技大學
95學年度碩士班入學招生考試試題

系所：資管系
科目：計算機概論 (甲)

二、選擇題：(70%，單選題，答案請採橫式書寫，每行五題)

1. Choose the item that is mostly used with data mining:

   (A). Pattern Recognition (B). Agent

   (C). Fuzzy Logic (D). Knowledge Representation

2. What are neural nets good at?

   (A). Step by step instructions (B). Logical rules

   (C). Learning from experiences (D). Linear thinking

3. Choosing from the following options, the most important item with regard to animation is:

   (A). color (B). picture size (C). frame rate (D). audio files

4. _____ is a mathematical technique for dealing with imprecise data and problems that have many solutions rather than one.

   (A). Fuzzy logic (B). Pattern recognition

   (C). Agent (D). Knowledge representation

5. A(n) ____ relies on a grid of transistors arranged by rows and columns.

   (A). paper-white display (B). passive matrix LCD

   (C). electroluminescent display (D). active matrix LCD

6. Cyan, ____, yellow, and black are sometimes called subtractive colors.

   (A). red (B). blue (C). green (D). magenta

7. DSL is a type of _____.

   (A). WAN (B). LAN

   (C). digital telephone service (D). analog telephone service

8. ____ are used during program design to plan the programming process.

(A). Message pipes (B). Compilers

(C). Prototypes (D). Assemblers

9. A maximum dot pitch of _____ is recommended to protect a user's vision.

(A). .028 mm (B). .28 mm

(C). .288 mm (D). none of the above

10. Double Data Rate SDRAM (DDR SDRAM) chips are even faster than SDRAM chips because they _____.

(A). transfer data twice for each clock cycle

(B). are synchronized to the system clock

(C). do not have to be re-energized as often

(D). use pipelining techniques

11. A ring network _____ to install.

(A). must span a smaller distance than a bus network, and it is more difficult

(B). must span a smaller distance than a bus network, but it is easier.

(C). can span a larger distance than a bus network, but it is more difficult

(D). can span a larger distance than a bus network, and it is easier

12. The advantage of a multidimensional database is that

(A). there is a common query language

(B). the content of all dimensions is the same regardless of the subject

(C). it can consolidate data much faster than a relational database

(D). all of the above

13. ____, which provides encryption of all data that passes between a client and an Internet server, requires only that the client has a digital certificate.

(A). Secure Sockets Layer (SSL)

(B). Secure HTTP (S-HTTP)

(C). Secure Electronics Transactions (SET) Specifications

(D). Pretty Good Privacy (PGP)

14. Integrated case products, sometimes called I-CASE or a CASE workbench, include these capabilities: _____.

(A). project repository and graphics

(B). prototyping and quality assurance

(C). code generators and housekeeping

(D). all of the above

15. An information system that captures and processes data from day-to-day business activities is called a(n) ____.

(A) office information system (OIS)

(B). transaction processing system (TPS)

(C). management information system (MIS)

(D). decision support system (DSS)

【下頁尚有試題】

國立雲林科技大學
95 學年度碩士班入學招生考試試題

系所：資管系
科目：計算機概論 (甲)

16. 下列關於乙太網路(Ethernet)10Base-T 的敘述，何者錯誤？

(A). 屬於分享式網路，採用 CSMA/CD 的碰撞處理方式傳輸資料

(B). 網路上用戶多時，頻寬會損失，傳輸速率會變慢

(C). 可以完整傳輸多媒體資料

(D). 採用雙絞線作爲傳輸媒體

17. 若 CPU 可直接存取 1M Bytes 的記憶體，則最少需要幾條位址線？

(A). 20 (B). 22 (C). 24 (D). 26

18. 下列關於 RS-232 的敘述，何者錯誤？

(A). 乃美國 EIA 規格 (B). 可將個人電腦與 MODEM 連接起來

(C). 屬於界面的硬體規格 (D). 是並列式傳送

19. 下列關於路由器(Router)的敘述，何者錯誤？

(A). 它主要是 OSI 通訊協定標準第三層，即網路層的設備

(B). 能夠整合不同的網路系統，例如 Ethernet 與 Token-Ring

(C). 可連接 LAN 與它的 ISP 網路

(D). 無法取代橋接器(Bridge)的功能

20. 下列關於光纖網路 FDDI 的敘述，何者錯誤？

(A). 是一種低成本的高速網路 (B). 傳輸速率爲 100Mbps

(C). 適合即時性多媒體資訊傳輸 (D). 網路爲雙環架構，容錯性高

21. 下列關於分封交換(Packet Switching)與電路交換(Circuit Switching)的敘述，何者錯誤？

(A). 使用 Packet Switching 將會把資料拆成固定大小的封包格式

(B). Circuit Switching 將傳輸的資料先輸送到某一共通的交換點儲存、等候，等線路有空時，資料才被送到另一交換點儲存、等候，如此一點一點的傳下去，直到目的端點爲止

(C). Packet Switching 適用於通信時間較分散的用戶

(D). Circuit Switching 適用於時常需要與不同的對象通訊的用戶

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22. 下列關於非同步傳輸模式(ATM)的敘述，何者錯誤？

(A). 採取星狀架構（Star Topology），以交換（Switch)方式存取資訊

(B). 可傳輸多媒體資料

(C). 屬於一種高速網路，不同速度無法相容

(D). 提供預接式（Connection-Oriented）的服務

23. Windows NT/2000 作業系統中，如果在使用 TCP/IP 通訊協定時，要動態管理 IP 位址，則應架設下列何種系統？

(A). WINS　　(B). DNS

(C). DHCP　　(D). Application Server

24. 下列關於搜尋(Search)的敘述，何者錯誤？

(A). 循序搜尋法(Sequential Search)的儲存空間最有效率，平均搜尋速度較慢

(B). 二分搜尋法(Binary Search)中，搜尋的檔案需先排序

(C). 區段搜尋法(Block Search)中，第 n 個 Block 中所有的資料也必須排序好

(D). 如果欲搜尋的資料分佈平均的話，可以使用插補搜尋法（Interpolation Search）來進行搜尋，在搜尋的對象大於 500 時，插補搜尋法會比二分搜尋法來的快速

25. 下列關於 DES (Data Encryption Standard)密碼演算法的敘述，何者錯誤？

(A). 除密碼金鑰較短爲人詬病外，還無法根本破解 DES

(B). DES 的加密方法是透過 16 回合的運算所組成

(C). DES 的金鑰長度爲 56 個位元

(D). DES 安全性較 IDEA 高

26. When a computer can correctly recognize faces of users with a high degree of reliability, it is using:

(A). image analysis　　(B). OCR

(C). pattern recognition　　(D). fuzzy logic

27. When a software engineer attempts to prove the correctness of her program, she is developing _____ techniques.

(A). beta testing　　(B). alpha testing

(C). prototype　　(D). program verification

28. Many small- and medium-sized businesses use e-commerce software developed by other businesses; these businesses therefore use:

(A). server software (B). server firewalls

(C). Web client software (D). Web hosting service

29. What tool provides managers with optimistic, pessimistic, and most likely estimates for completion of each project activity?

(A). Cost-benefit analysis (B). Data flow diagram

(C). Gantt chart (D). PERT chart

30. What is the name for a set of protocols that enables business partners to share a secure "tunnel" through the public Internet?

(A). Compressed network (B). Intranet

(C). Virtual Private network (D). SecureNet

31. Computer-generated worlds that created the illusion of immersion are known as:

(A). virtual worlds (B). hypermedia (C). hyperlinks (D). real time

32. The act of accessing data about other people through credit card information, credit bureau data, and public records and then using the data as their own is known as:

(A). identity theft (B). personal theft

(C). burglary (D). a Big Brother crime

33. What is the act of removing erroneous data from a database called:

(A). Data Scrubbing (B). Data deletion

(C). Data synchronization (D). Data doodling

34. An Internet diary or ongoing commentaries are known as:

(A). blogs (B). an intranet (C). plug-in (D). a cookie

35. Using Napster to make music files from one hard drive available to others rather than posting on a central server is an example of:

(A). client/server sharing (B). server/client software downloading

(C). LAN sharing (D). peer-to-peer file sharing

【下頁尚有試題】

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三、簡答題：10%

1. 何謂 Grid Computing？

2. 試比較一般網路廣播與 Podcast 之特性有何不同？（例如，檔案格式等特性，請以表格格式回答）

【試題結束】

國立雲林科技大學
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系所：資管系
科目：資料結構

1、(20%) 在一個「未經排序」的二元樹上，每個節點的值爲一個任意的正整數值，在所有比平均值高的節點中，請找出最小值節點的值。

2、(15%) 將右列的值 2, 1, 4, 5, 9, 3, 6, 7 依序插入一個最初爲空的 AVL 樹，並顯示將每個值插入的結果(註：如果樹需要作旋轉動作的話，請顯示旋轉前、旋轉之間、旋轉之後的結果)。

3、(15%) 某位教授宣稱如果用前序走過(preorder traversal)的作法，可以將一個 Heap 結構的樹，列印出大小排序好的順序，試畫圖舉証他的說法是「錯的」。

4、(10%) 有一段由 ABCDEF 六個字元所形成的字串，其出現次數分別爲 A:2 次、B:3 次、C:5 次、D:13 次、E:15 次、F:18 次，請問這段字串由霍夫曼編碼法(Huffman Coding)壓縮後的長度會是多少位元？(若無計算過程，則不予計分)

5、(10%) 請以 Heap Sort 的方法對整數數列依序 49, 53, 12, 24, 99, 1, 38 進行排序。(若無畫出過程，則不予計分)

6、(15%) 形成 8 層的高度平衡樹(AVL Tree)，最少需要幾個節點？(若無計算或推導過程，則不予計分)

7、(15%) 下列是遞迴函數 F(X, n)的定義，試求 F(2, 20)=?

```
Function F( X, n: integer): integer;
Begin
    If n=1 then F := X
    Else F := X * F(X, n-1);
End;
```

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In this test, there are 25 multiple choice questions with 4 points for each question. Please select the correct answer for each question.

1. Flip a fair coin in a sequence of independent trials. What is the probability that the first "head" is observed on the fifth trial, given that "tails" are observed on each of the first three trials?
   (A) 0.15 (B) 0.25 (C) 0.35 (D) 0.45 (E) 0.55

2. What is the probability that a person tossing three fair coins will get either all "heads" or all "tails" for the second time on the fifth toss?
   (A) 0.1055 (B) 0.2245 (C) 0.3625 (D) 0.4195 (E) 0.5

3. Suppose that four inspectors at a film factory are supposed to stamp the expiration date on each package of film at the end of the assembly line. John, who stamps 20% of the packages, fails to stamp the expiration date once in every 200 packages; Tom, who stamps 60% of the packages, fails to stamp the expiration date once in every 100 packages; Jeff, who stamps 15% of the packages, fails to stamp the expiration date once in every 90 packages; and Pat, who stamps 5% of the packages, fails to stamp the expiration date once in every 200 packages. If a customer complains that her package of film does not show the expiration date, what is the probability that it was inspected by John?
   (A) 0.0899 (B) 0.0945 (C) 0.0998 (D) 0.1033 (E) 0.1124

4. In a daily production of a certain kind of rope, the number of defects per foot, denoted by Y, is assumed to have a Poisson distribution with mean 2. The profit per foot when the rope is sold is given by X, where $X = 50 - 2Y - Y^2$. What is the expected profit per foot?
   (A) 30 (B) 32 (C) 35 (D) 38 (E) 40

5. A lot containing seven components is sampled by a quality inspector; the lot contains 4 good components and 3 defective components. A sample of size 3 is taken by the inspector. What is the expected value of the number of good components in this sample?
   (A) 1.5 (B) 1.6 (C) 1.7 (D) 1.8 (E) 1.9

6. Let X be a random variable with the following probability distribution:

x	-3	6	9
$f(x)$	1/6	1/2	1/3

   What is the standard deviation of the random variable $Y = (2X+1)^2$?

(A) 111.1 (B) 113.6 (C) 115.3 (D) 118.9 (E) 120.8

7. A safety engineer claims that only 40% of all workers wear safety helmets when they eat lunch at the workplace. Assuming that his claim is right, what is the probability that 4 of 6 workers randomly chosen will be wearing their helmets while having lunch at the workplace?
(A) 0.1382 (B) 0.1513 (C) 0.1728 (D) 0.1998 (E) 0.2156

8. Roll a fair four-faced die twice. (Note that the numbers on the four faces of the die are respectively 1, 2, 3 and 4.) Let X denote the outcome on the first roll, and let Y be the sum of two rolls. What is the covariance of X and Y?
(A) 0.5 (B) 0.75 (C) 1 (D) 1.25 (E) 1.5

9. At busy time, a telephone exchange is very near capacity, so people cannot find a line to use. It may be of interest to know the number of attempts necessary in order to gain a connection. Suppose that the probability of a connection during busy time is 0.05. What is the probability that five attempts are necessary for a successful call?
(A) 0.037 (B) 0.041 (C) 0.045 (D) 0.05 (E) 0.054

10. Gauges are used to reject all components in which a certain dimension is not within the specification $1.5 \pm d$. It is known that this measurement is normally distributed with mean 1.5 and standard deviation 0.2. What is the value of d such that the specifications cover 95% of the measurements?
(A) 0.333 (B) 0.367 (C) 0.392 (D) 0.418 (E) 0.45

11. In a mathematics examination the average grade was 82 and the standard deviation was 5. All students with grades from 88 to 94 received a grade of B. If the grades are approximately normally distributed and 8 students received a B grade, how many students took the examination?
(A) 62 (B) 65 (C) 68 (D) 70 (E) 72

12. An electrical firm manufactures light bulbs that have a length of life that is approximately normally distributed, with mean equal to 800 hours and a standard deviation of 40 hours. What is the probability that a random sample of 16 bulbs will have an average life of less than 775 hours?
(A) 0.0058 (B) 0.0062 (C) 0.0065 (D) 0.0068 (E) 0.0072

13. The distribution of heights of a certain breed of terrier dogs has a mean height of 72 centimeters and a standard deviation of 10 centimeters, whereas the distribution of heights of a certain breed of poodles has a mean height of 28 centimeters and a standard deviation of 5 centimeters. Assuming that the sample means can be measured to any degree of accuracy, what is the probability that the sample mean for a random sample of heights of 64 terriers exceeds the sample mean for a random sample of heights of 100 poodles by at most 44.2 centimeters?
(A) 0.2231 (B) 0.3379 (C) 0.4435 (D) 0.5596 (E) 0.6628

14. The manager of a grocery store has taken a random sample of 100 customers. The average length of time it took the customers in the sample to check out was 3.1 minutes with a standard deviation of 0.5 minutes. We want to test to determine whether or not the mean waiting time of all customers is significantly more than 3 minutes. The p-value of the test is
(A) 0.0228 (B) 0.0489 (C) 0.05 (D) .4972 (E) 0.12

15. The following information was obtained from matched samples. The daily production rates for a sample of workers before and after a training program are shown below.

Worker	Before	After
1	20	24
2	25	23
3	27	27
4	23	20
5	22	25
6	20	22
7	17	18

The alternative hypothesis to be tested is H_a: $\mu_{after} - \mu_{before} > 0$. The test statistic is
(A) 0. (B) 0.68 (C) 0.74 (D) 2.56 (E) 1.96

16. Suppose a department store wishes to estimate the average age of the customers of its contemporary apparel department, correct to within 3 years with probability equal to .90. Approximately how large a sample would be required if the estimated standard deviation of the customers' age is 8 years?
(A) 9 (B) 77 (C) 110 (D) 20 (E) 30

17. Suppose your firm has been experimenting with two different physical arrangements of its assembly line. It has been determined that both arrangements yield approximately the same average number of finished units per day. To obtain greater process control, you suggest that the arrangement with the smaller variance in the number of finished units per day can be permanently adopted. Two independent random samples yield the results shown below.

Assembly Line 1	Assembly Line 2
Sample mean=85	Sample mean=87
Sample variance=1200	Sample variance=3500
Sample size=21 days	Sample size=21 days

What is the value of the test statistic for determining whether two assembly lines differ in the variation of the number of units produced per day?

(A) 0.13 (B) 1.71 (C) 2 (D) 2.92 (E) 7.434

18. Consider the random variable X with density given by

$$P(x)=\frac{1}{\theta^2}xe^{-x/\theta},\ x>0,\ \theta>0$$

Find the maximum likelihood estimator for θ based on a random sample of size n.

(A) $\bar{x}$ (B) $\bar{x}/2$ (C) $2\bar{x}$ (D) $\sum_{i=1}^{n}x_i$ (E) S^2

Use the following problem to answer questions 19-20.

Based on a sample of the salaries of professors at a major university, you have performed a multiple linear regression model is

Salary=\$45000+\$3000(Years)+\$4000(Gender)+\$1000[(Year)(Gender)]

where Gender=1 if the professor is male and Gender=0 if the professor is female.

19. Using the multiple regression equation, you would estimate the average difference in the salaries of a male professor with three years of service and female professor with three years of service to be

(A) \$45000 (B) \$3000 (C) \$4000
(D) \$5000 (E) \$7000.

20. Using the multiple regression equation, you would estimate the average salary of male professors with 4 years of experience to be
(A) $16000 (B) $57000 (C) $61000
(D) $65000 (E) $7000.

Use the following problem to answer questions 21-22.

In the past, 35% of the students at a University were in the Business College, 5% of the students were in the Liberal Arts College, and 30% of the students were in the Education College. To see whether or not the proportions have changed, a sample of 300 students was taken. Ninety of the sample students are in the Business College, 120 are in the Liberal Arts College, and 90 are in the Education College.

21. This problem is an example of a
(A) Normally distributed variable
(B) Test for independence
(C) Multinomial population
(D) Poisson distributed variable
(E) Binomial variable

22. At α=.05, which of the following statements is correct?
(A). Proportions have changed significantly
(B). Proportions have not changed significantly
(C). The critical value is 7.37776.
(D). The degree of freedom of the test statistic is 3.
(E). None of above is correct.

Use the following problem to answer questions 23-25.

A marketing researcher was studying the effect of a supermarket display on sales of a new product. There are two designs for the display: the first had greater visual appeal, and the second contained more factual information about the product. Each type of display could be made in three sizes, small, medium, or large. Eighteen supermarkets were available for the study, and three supermarkets were selected at random for each combination of display and size. The number of units of the product sold over a two week period was record for each supermarket. A partial result of ANOVA table is given below.

Source	DF	SS	MS	F	P
Design					0.613
Size			7256		
DesignxSize		41707			
Error			12262		
Total		206664			

23. The degrees of freedom for error are

(A) 1- (B) 2 (C) 6 (D) 12 (E) 17

24. What is the value of the mean square of the main effect for **Design**?

(A) 2085 (B) 3301 (C) 41707 (D) 12262 (E) 206664

25. The numerical value of the F statistic for testing interaction is

(A) 0.17 (B) 0.26 (C) 0.59 (D) 3.40 (E) 202.33

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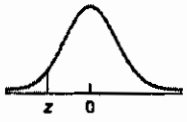
TABLE II
Areas under the standard normal curve



Second decimal place in z										
0.09	*0.08*	*0.07*	*0.06*	*0.05*	*0.04*	*0.03*	*0.02*	*0.01*	*0.00*	*z*
									0.0000†	*−3.9*
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	*−3.8*
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	*−3.7*
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	*−3.6*
0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	*−3.5*
0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	*−3.4*
0.0003	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	*−3.3*
0.0005	0.0005	0.0005	0.0006	0.0006	0.0006	0.0006	0.0006	0.0007	0.0007	*−3.2*
0.0007	0.0007	0.0008	0.0008	0.0008	0.0008	0.0009	0.0009	0.0009	0.0010	*−3.1*
0.0010	0.0010	0.0011	0.0011	0.0011	0.0012	0.0012	0.0013	0.0013	0.0013	*−3.0*
0.0014	0.0014	0.0015	0.0015	0.0016	0.0016	0.0017	0.0018	0.0018	0.0019	*−2.9*
0.0019	0.0020	0.0021	0.0021	0.0022	0.0023	0.0023	0.0024	0.0025	0.0026	*−2.8*
0.0026	0.0027	0.0028	0.0029	0.0030	0.0031	0.0032	0.0033	0.0034	0.0035	*−2.7*
0.0036	0.0037	0.0038	0.0039	0.0040	0.0041	0.0043	0.0044	0.0045	0.0047	*−2.6*
0.0048	0.0049	0.0051	0.0052	0.0054	0.0055	0.0057	0.0059	0.0060	0.0062	*−2.5*
0.0064	0.0066	0.0068	0.0069	0.0071	0.0073	0.0075	0.0078	0.0080	0.0082	*−2.4*
0.0084	0.0087	0.0089	0.0091	0.0094	0.0096	0.0099	0.0102	0.0104	0.0107	*−2.3*
0.0110	0.0113	0.0116	0.0119	0.0122	0.0125	0.0129	0.0132	0.0136	0.0139	*−2.2*
0.0143	0.0146	0.0150	0.0154	0.0158	0.0162	0.0166	0.0170	0.0174	0.0179	*−2.1*
0.0183	0.0188	0.0192	0.0197	0.0202	0.0207	0.0212	0.0217	0.0222	0.0228	*−2.0*
0.0233	0.0239	0.0244	0.0250	0.0256	0.0262	0.0268	0.0274	0.0281	0.0287	*−1.9*
0.0294	0.0301	0.0307	0.0314	0.0322	0.0329	0.0336	0.0344	0.0351	0.0359	*−1.8*
0.0367	0.0375	0.0384	0.0392	0.0401	0.0409	0.0418	0.0427	0.0436	0.0446	*−1.7*
0.0455	0.0465	0.0475	0.0485	0.0495	0.0505	0.0516	0.0526	0.0537	0.0548	*−1.6*
0.0559	0.0571	0.0582	0.0594	0.0606	0.0618	0.0630	0.0643	0.0655	0.0668	*−1.5*
0.0681	0.0694	0.0708	0.0721	0.0735	0.0749	0.0764	0.0778	0.0793	0.0808	*−1.4*
0.0823	0.0838	0.0853	0.0869	0.0885	0.0901	0.0918	0.0934	0.0951	0.0968	*−1.3*
0.0985	0.1003	0.1020	0.1038	0.1056	0.1075	0.1093	0.1112	0.1131	0.1151	*−1.2*
0.1170	0.1190	0.1210	0.1230	0.1251	0.1271	0.1292	0.1314	0.1335	0.1357	*−1.1*
0.1379	0.1401	0.1423	0.1446	0.1469	0.1492	0.1515	0.1539	0.1562	0.1587	*−1.0*
0.1611	0.1635	0.1660	0.1685	0.1711	0.1736	0.1762	0.1788	0.1814	0.1841	*−0.9*
0.1867	0.1894	0.1922	0.1949	0.1977	0.2005	0.2033	0.2061	0.2090	0.2119	*−0.8*
0.2148	0.2177	0.2206	0.2236	0.2266	0.2296	0.2327	0.2358	0.2389	0.2420	*−0.7*
0.2451	0.2483	0.2514	0.2546	0.2578	0.2611	0.2643	0.2676	0.2709	0.2743	*−0.6*
0.2776	0.2810	0.2843	0.2877	0.2912	0.2946	0.2981	0.3015	0.3050	0.3085	*−0.5*
0.3121	0.3156	0.3192	0.3228	0.3264	0.3300	0.3336	0.3372	0.3409	0.3446	*−0.4*
0.3483	0.3520	0.3557	0.3594	0.3632	0.3669	0.3707	0.3745	0.3783	0.3821	*−0.3*
0.3859	0.3897	0.3936	0.3974	0.4013	0.4052	0.4090	0.4129	0.4168	0.4207	*−0.2*
0.4247	0.4286	0.4325	0.4364	0.4404	0.4443	0.4483	0.4522	0.4562	0.4602	*−0.1*
0.4641	0.4681	0.4721	0.4761	0.4801	0.4840	0.4880	0.4920	0.4960	0.5000	*−0.0*

† For $z \leq -3.90$, the areas are 0.0000 to four decimal places.

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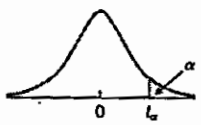
TABLE IV
Values of t_α

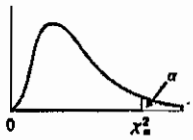


df	$t_{0.10}$	$t_{0.05}$	$t_{0.025}$	$t_{0.01}$	$t_{0.005}$	df
1	3.078	6.314	12.706	31.821	63.657	1
2	1.886	2.920	4.303	6.965	9.925	2
3	1.638	2.353	3.182	4.541	5.841	3
4	1.533	2.132	2.776	3.747	4.604	4
5	1.476	2.015	2.571	3.365	4.032	5
6	1.440	1.943	2.447	3.143	3.707	6
7	1.415	1.895	2.365	2.998	3.499	7
8	1.397	1.860	2.306	2.896	3.355	8
9	1.383	1.833	2.262	2.821	3.250	9
10	1.372	1.812	2.228	2.764	3.169	10
11	1.363	1.796	2.201	2.718	3.106	11
12	1.356	1.782	2.179	2.681	3.055	12
13	1.350	1.771	2.160	2.650	3.012	13
14	1.345	1.761	2.145	2.624	2.977	14
15	1.341	1.753	2.131	2.602	2.947	15
16	1.337	1.746	2.120	2.583	2.921	16
17	1.333	1.740	2.110	2.567	2.898	17
18	1.330	1.734	2.101	2.552	2.878	18
19	1.328	1.729	2.093	2.539	2.861	19
20	1.325	1.725	2.086	2.528	2.845	20
21	1.323	1.721	2.080	2.518	2.831	21
22	1.321	1.717	2.074	2.508	2.819	22
23	1.319	1.714	2.069	2.500	2.807	23
24	1.318	1.711	2.064	2.492	2.797	24
25	1.316	1.708	2.060	2.485	2.787	25
26	1.315	1.706	2.056	2.479	2.779	26
27	1.314	1.703	2.052	2.473	2.771	27
28	1.313	1.701	2.048	2.467	2.763	28
29	1.311	1.699	2.045	2.462	2.756	29
30	1.310	1.697	2.042	2.457	2.750	30
31	1.309	1.696	2.040	2.453	2.744	31
32	1.309	1.694	2.037	2.449	2.738	32
33	1.308	1.692	2.035	2.445	2.733	33
34	1.307	1.691	2.032	2.441	2.728	34
35	1.306	1.690	2.030	2.438	2.724	35
36	1.306	1.688	2.028	2.434	2.719	36
37	1.305	1.687	2.026	2.431	2.715	37
38	1.304	1.686	2.024	2.429	2.712	38
39	1.304	1.685	2.023	2.426	2.708	39
40	1.303	1.684	2.021	2.423	2.704	40
41	1.303	1.683	2.020	2.421	2.701	41
42	1.302	1.682	2.018	2.418	2.698	42
43	1.302	1.681	2.017	2.416	2.695	43
44	1.301	1.680	2.015	2.414	2.692	44
45	1.301	1.679	2.014	2.412	2.690	45
46	1.300	1.679	2.013	2.410	2.687	46
47	1.300	1.678	2.012	2.408	2.685	47
48	1.299	1.677	2.011	2.407	2.682	48
49	1.299	1.677	2.010	2.405	2.680	49

國立雲林科技大學
95 學年度碩士班入學招生考試試題

系所：工管所、資管系
科目：統計學

TABLE VII
Values of χ^2_α



df	$\chi^2_{0.995}$	$\chi^2_{0.99}$	$\chi^2_{0.975}$	$\chi^2_{0.95}$	$\chi^2_{0.90}$
1	0.000	0.000	0.001	0.004	0.016
2	0.010	0.020	0.051	0.103	0.211
3	0.072	0.115	0.216	0.352	0.584
4	0.207	0.297	0.484	0.711	1.064
5	0.412	0.554	0.831	1.145	1.610
6	0.676	0.872	1.237	1.635	2.204
7	0.989	1.239	1.690	2.167	2.833
8	1.344	1.646	2.180	2.733	3.490
9	1.735	2.088	2.700	3.325	4.168
10	2.156	2.558	3.247	3.940	4.865
11	2.603	3.053	3.816	4.575	5.578
12	3.074	3.571	4.404	5.226	6.304
13	3.565	4.107	5.009	5.892	7.042
14	4.075	4.660	5.629	6.571	7.790
15	4.601	5.229	6.262	7.261	8.547
16	5.142	5.812	6.908	7.962	9.312
17	5.697	6.408	7.564	8.672	10.085
18	6.265	7.015	8.231	9.390	10.865
19	6.844	7.633	8.907	10.117	11.651
20	7.434	8.260	9.591	10.851	12.443
21	8.034	8.897	10.283	11.591	13.240
22	8.643	9.542	10.982	12.338	14.041
23	9.260	10.196	11.689	13.091	14.848
24	9.886	10.856	12.401	13.848	15.659
25	10.520	11.524	13.120	14.611	16.473
26	11.160	12.198	13.844	15.379	17.292
27	11.808	12.879	14.573	16.151	18.114
28	12.461	13.565	15.308	16.928	18.939
29	13.121	14.256	16.047	17.708	19.768
30	13.787	14.953	16.791	18.493	20.599
40	20.707	22.164	24.433	26.509	29.051
50	27.991	29.707	32.357	34.764	37.689
60	35.534	37.485	40.482	43.188	46.459
70	43.275	45.442	48.758	51.739	55.329
80	51.172	53.540	57.153	60.391	64.278
90	59.196	61.754	65.647	69.126	73.291
100	67.328	70.065	74.222	77.930	82.358

TABLE VII (cont.)
Values of χ^2_α

$\chi^2_{0.10}$	$\chi^2_{0.05}$	$\chi^2_{0.025}$	$\chi^2_{0.01}$	$\chi^2_{0.005}$	df
2.706	3.841	5.024	6.635	7.879	*1*
4.605	5.991	7.378	9.210	10.597	*2*
6.251	7.815	9.348	11.345	12.838	*3*
7.779	9.488	11.143	13.277	14.860	*4*
9.236	11.070	12.833	15.086	16.750	*5*
10.645	12.592	14.449	16.812	18.548	*6*
12.017	14.067	16.013	18.475	20.278	*7*
13.362	15.507	17.535	20.090	21.955	*8*
14.684	16.919	19.023	21.666	23.589	*9*
15.987	18.307	20.483	23.209	25.188	*10*
17.275	19.675	21.920	24.725	26.757	*11*
18.549	21.026	23.337	26.217	28.300	*12*
19.812	22.362	24.736	27.688	29.819	*13*
21.064	23.685	26.119	29.141	31.319	*14*
22.307	24.996	27.488	30.578	32.801	*15*
23.542	26.296	28.845	32.000	34.267	*16*
24.769	27.587	30.191	33.409	35.718	*17*
25.989	28.869	31.526	34.805	37.156	*18*
27.204	30.143	32.852	36.191	38.582	*19*
28.412	31.410	34.170	37.566	39.997	*20*
29.615	32.671	35.479	38.932	41.401	*21*
30.813	33.924	36.781	40.290	42.796	*22*
32.007	35.172	38.076	41.638	44.181	*23*
33.196	36.415	39.364	42.980	45.559	*24*
34.382	37.653	40.647	44.314	46.928	*25*
35.563	38.885	41.923	45.642	48.290	*26*
36.741	40.113	43.195	46.963	49.645	*27*
37.916	41.337	44.461	48.278	50.994	*28*
39.087	42.557	45.722	49.588	52.336	*29*
40.256	43.773	46.979	50.892	53.672	*30*
51.805	55.759	59.342	63.691	66.767	*40*
63.167	67.505	71.420	76.154	79.490	*50*
74.397	79.082	83.298	88.381	91.955	*60*
85.527	90.531	95.023	100.424	104.213	*70*
96.578	101.879	106.628	112.328	116.320	*80*
107.565	113.145	118.135	124.115	128.296	*90*
118.499	124.343	129.563	135.811	140.177	*100*