**SOLE – The International Society of Logistics**


®

# A Study Guide for the

# Certified Professional Logistician (CPL) Examination Program

**June 2012**

# CPL Study Guide
# June 2012

***Certification by a recognized professional organization has always been the hallmark of individual excellence in one's chosen profession.***

***For Logisticians this certification takes the form of the Certified Professional Logistician or CPL designation from SOLE – The International Society of Logistics. Attainment of this certification attests to our employers', fellow employees, and customers the commitment that we as individuals and as an organization have to providing the best logistics services and support for their programs.***

# CPL Study Guide
# June 2012



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Note: This document is considered current as of the date of issue. The CPL exam itself is continually being updated to reflect developments in changing technology. However, the fundamentals of Logistics, as covered in this guide remain the foundation of the exam and cover the majority of questions and answers. The entire guide will be re-issued on a regular basis to reflect new developments as they are incorporated into the CPL exam materials.

# CPL Study Guide
# June 2012

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# Part I  Introduction and Overview of the CPL Program

## 1.0 INTRODUCTION

This guide provides a general outline of the scope and depth of knowledge that an individual is required to attain to successfully complete the examination leading to certification as a professional logistician.

This guide is not intended as a shortcut for individuals to gain superficial knowledge in order to pass the examination.

A companion document set is provided to local SOLE Chapters, which will assist them in conducting a comprehensive study program preparing individuals to assume roles as logisticians in industry and government. This set of materials requires knowledgeable instructors to supplement the provided notes and slides to teach the subject matter in each of the areas of Logistics

### 1.1 The Certified Professional Logistician Program

The practice of logistics is a professional discipline. SOLE - The International Society of Logistics (SOLE) Professional Certification Program recognizes the professional stature and ethics of logisticians within commerce, industry, defense, federal and local government agencies, and both academic and private institutions. The adoption of a certification program in October 1972 was a major step by SOLE to further the accreditation of professionals in the logistics field. This certification recognizes the functional interrelationships within the professional responsibilities of logisticians regardless of their occupational roles.

The title "Certified Professional Logistician" will be granted to individuals of proven competence in logistics that pass an examination designed to test their broad knowledge of the entire logistics spectrum.

The Certification Program is administered by the Certified Professional Logistician Qualification Review Board (CPL-QRB) responsible for reviewing the eligibility of applicants, the conduct of the examination itself, and notifying candidates of the results.

#### *1.1.1 CPL Certificate, Identification Cards and Lapel Pins*

Candidates who successfully pass the certification examination are awarded a specially designed certificate, identification card, and lapel pin attesting to their accomplishment.

Successful candidates of the certification examination are granted the designation of "Certified Professional Logistician (C.P.L.)," by SOLE-The International Society of Logistics. The professional designation should be used in a dignified manner similar to the recognition accorded the accounting, medical insurance and other professionals. Either the full expression or the initials may be used after the individual's name on business cards and stationery but always in a manner consistent with the dignity of the Society.

## 1.2. The Examination

Examinations are held twice annually, in May and November, at announced times and are conducted by a proctor selected by the administering local SOLE chapter.

### *1.2.1 Exam Overview*

The CPL examination itself is often ranked as the equivalent of a Masters Degree for logistics managers and practitioners. The CPL examination consists of four parts, each part consisting of 100 multiple choice questions. The four parts are as follows:

I - Systems Management.

II - Systems Design and Development.

III - Acquisition and Production Support.

IV - Distribution and Customer Support.

The subject areas covered in each of these exam areas are detailed in part 2 of this Study Guide.

### *1.2.2 Examination Process*

The examination is conducted during one continuous eight-hour period, which consists of four two-hour sessions, with short breaks between sessions.

Initially the CPL candidate takes four parts at one time and must pass all four parts to be certified. If less than three of the four parts are passed, all four parts must be retaken to qualify as a CPL. If three parts are passed, the candidate is permitted to retake only the one part failed but must do so within the next four examination dates. If not done within that time frame a new application must be submitted and approved, and all four parts must be retaken.

There is no limit to the number of times an individual may apply to take the examination.

Multiple choice questions are used, and the examination is "closed book." Only non-programmable calculators are acceptable, and no reference material, other than that authorized by SOLE, is permitted in the testing area. Completed examination papers are sent to the SOLE Education Committee for grading. The results of the examination are then forwarded to the CPL-QRB for notification of the examinees. (This process may take up to 2 months)

## 1.3. Application Process

### *1.3.1 Process and due dates*

The application for the examination is available from SOLE, or off the SOLE website at www.sole.org/cpl.asp. This application must be processed to arrive at SOLE Headquarters not later than **3 months before the desired examination date**. This means that if you wish to sit for the November examination your application should arrive at SOLE no later than the first of September. For the May date it should arrive no later than the first of February.

Applications reflect your personal professionalism and as such should be typed or filled in on a computer. An electronic version of the application is available at the SOLE Website and may be downloaded on an individual basis.

### *1.3.2 Qualifications for application*

To take the CPL examination, applicants must submit an examination application showing they meet the eligibility requirements based on a combination of education and practical experience in the fields of Logistics.

| Option | Educational (Note 2) | Experience (Note 1) |
|---|---|---|
| | | |
| A | No Formal Degree | 9 Years |
| B | Bachelor's Degree | 5 Years |
| C | Masters Degree | 4 Years |
| D | Doctorate | 3 Years |

Note 1: Experience requirements need at a minimum 2 years experience in least two of the following fields (persons with a doctoral degree may have experience in only one area) of Logistics:

- Systems Management
- System Design and Development
- Acquisition and Product Support
- Distribution and Customer Support

Note 2: Educational Equivalents - Each academic year of undergraduate accredited coursework in logistics subjects equivalent to one year of professional experience, with undergraduate credits limited to the equivalent of four years experience.

Tasks associated with each of the Logistics fields are shown in the table on the following page. These are examples and other tasks in these areas are also applicable

| ***Systems Management*** | ***Systems Development and Design*** | ***Acquisition and Product Support*** | ***Distribution and Customer Support*** |
|---|---|---|---|
| | | | |
| • Feasibility Studies | • Preliminary and Detailed Design Activities | • Logistics Support Analysis and LSAR | • Physical Supply and Distribution |
| • Operations Research and Systems Analysis | • Conceptual Design | • Provisioning | • Materials Requirements Planning |
| • Contingency Planning | • Reliability Engineering | • Parts Control and Standardization | • Packaging |
| • Sensitivity Analysis | • Maintainability Engineering | • Procurement | • Transportation |
| • Risk and Uncertainty Determinations | • Logistics Research | • Contracts and Warranties | • Traffic Administration |
| • Financial Management | • Computer Aided Acquisition and Logistics Support | • Production Support | • Warehousing and Storage |
| • Cost Accounting | • Computer Technology | • Production Requirements | • Technology Infusion |
| • Life Cycle Cost | • Human Factors and Safety Engineering | • Production Planning | • International Commerce and Shipping |
| • Time Value of Money | • Design Support | • Production Engineering | • Maintenance |
| • Return on Investment | • Statistics | • Production Management | • Technical Publications |
| • Payback and Break-even Analysis | • Forecasting | • Production Analysis | • Training and Education |
| • Management Information Systems | • Predicting | • Plant Engineering | • Systems and Equipment Phaseout |
| • Logistics Planning and Management | • Test Planning | • Manufacturing | • Environmental Science |
| • Proposals | • Functional Testing | • Engineering | • Purchasing and Procurement |
| • Source Selection | • User Test and Evaluation | • Manufacturing | • Material Flow |
| • Contract Negotiations | • | • Estimating | • Inventory Control |
| • Supervision | • | • Methods Engineering | • Reverse Logistics |
| | | • Production Control | • Customer Service |
| | | • Quality Assurance | • Order Processing |
| | | • Quality Control | • Supply Chain Management |
| | | • Queuing Analysis | • Logistics Organizations |
| | | • Materials Requirements Planning and Analysis | • |

### 1.5. Administration of the CPL and placement in the SOLE Organization

The CPL Examination is placed under the auspices of the Director of Education for the Society. The applications for the exam are reviewed by the members of the Qualification Review Board. The examination itself is managed by four exam principals, one for each part of the exam.

Director of Education: A member of the Board of Directors for the Society provides overall management of the CPL process.

The Qualification Review Board consists of representatives of the Industrial and Academic community and provides a review of the individual qualifications prior to the taking of the exam. This board provides the members of the society with an evaluation of their qualifications to sit for the exam.

The exam principals provide the overall management of the exam itself. They are responsible for maintaining the exam current with the practices in industry and Government. These members review all questions and maintain the study guide and study materials needed for exam preparation current with the contents of the exam. They select the questions for each sitting of the exam to maintain the continuing integrity of the exam process.

The exam is graded by a representative of the principals using the current processes available at existing educational institutions.

Recertification support is provided by a separate committee operating in conjunction with the QRB and Exam Principals to verify applicability of specific activities to the established requirements.

### 1.6 Re-certification

**"Recognition of continuing commitment to excellence in our profession"**

The practice of Logistics, like the technology we employ and support, has evolved at an ever-increasing rate since the founding of the Society. The Society itself, and the recognition of professionalism through the Certified Professional Logistician program, has continued to grow and keep pace with the changes in technology. We have witnessed changes in our basic processes, our individual domains and general deregulation of major industries.

Throughout this period the Society, and its members, have kept you abreast of the changes and in many cases led the way for the implementation of new ideas. Key to your

professional development and growth during this period has been your participation in seminars and educational opportunities assisting in developing new skills, or honing existing ones.

Recognizing this evolution the Society has adopted the Re-Certification process for members who have earned the title of Certified Professional Logistician. This re-certification is an affirmation by the society of your commitment to continued professionalism in the practice of Logistics. Points are awarded to CPLs for activities that reflect their participation in personal education and in the continuing education of other members of the society through publications of logistics related articles, college courses in logistics related areas, industry sponsored logistics training, and participation in logistics and engineering seminars and symposiums.

The CPL Re-Certification committee, will review applications, and maintain historical files of the points that are achieved. A separate list of approved activities and points awarded for each is provided after you successfully complete the CPL exam.

After your application for recertification is approved you will be issued a new identification card indicating your new status and the date the application was approved.

# Part 2 Overview of the examination, a review of recommended educational experiences, and reading lists.

- **Educational Recommendations**

As noted in the section on the exam application you are required to have significant Logistics Education and experience before applying to sit for the examination. In addition in preparing for the examination you may wish to avail yourself of educational opportunities at local colleges and universities in several logistics related areas. Some suggested course areas are listed below:

**Associate Degree Programs:**

- Computer Engineering
- Production Planning
- Marketing & Purchasing
- Statistical Analysis & Methods
- Warehousing and Inventory Control
- Transportation and Distribution

**Baccalaureate Degree:**

- Systems Engineering and Analysis
- Logistics Management
- Warehousing and Inventory Control
- Transportation and Distribution
- Quality Assurance
- Life Cycle Support
- Production Planning and Cost Analysis
- Logistics Acquisition
- Marketing
- Purchasing and Procurement
- Human Resource Management
- Information Systems
- Contracts Management
- Business Law
- Government Contracts Law
- System Disposal

**Graduate Degree (Masters and Doctoral):**

- Logistics Research
- Reliability, Maintainability
- Human Factors
- Systems Analysis and Design
- Systems Management
- Production Planning and Control
- International Trade
- Packaging, Warehousing, and Inventory Management

## 2-2 Recommended Reference Texts

NOTE: Every effort has been made to verify that the following documents are available at the time the guide is released. Changes in availability will require the individual student to substitute similar texts by other authors in the field. Since all exam material is fundamental, rather than author specific, this should not present a problem to the individual student or class coordinator. Specific questions in this area should be addressed to the cpl e-mail addressee on the web site.

### 2.2.1 References for Part I of the CPL Examination *[NOTE: Publication dates are not listed, so as to accommodate all/latest editions; titles are listed alphabetically.]*

Blanchard, Benjamin, *Logistics Engineering and Management,* Upper Saddle River, NJ: Prentice Hall

Blanchard, Benjamin, *Systems Engineering Management,* New York: John Wiley & Sons & Sons

Bowersox, Donald J. and D.J. Closs, *Logistical Management,* New York: McGraw Hill

Coyle, John J.; Bardi, Edward J.; and Langley, C. John. *The Management of Business Logistics,* Minneapolis, MN: West Publishing Co.

Frohne, Philip T., CPL, *Quantitative Measurements for Logistics,* New York, NY: McGraw-Hill SOLE Press

Lambert, Douglas M., James R. Stock, and Lisa M Ellram, *Fundamentals of Logistics Management,* Boston: Irwin McGraw Hill

Langford, John W., *Logistics Principles and Applications,* New York, NY: McGraw Hill SOLE Press

Laudon, Kenneth C.; Laudon, Jane Price. Essentials of Management Information Systems, 2nd Edition. , NJ: Prentice-Hall

Ross, David F. Distribution: Planning and Control. Boston, Mass: Kluwer Academic Publishers

Silver, Edward A.; Pyke, David F.; Peterson, David F. *Inventory Management and Production Planning and Scheduling,* New York, NY: John Wiley & Sons & Sons

Tyworth, John E.; Cavinato, Joseph L.; Langley, C. John. *Traffic Management: Planning, Operations and Control*. Prospect Heights, IL: Waveland Press

### 2.2.2 References for Part II of the CPL examination:

Blanchard, Benjamin, *Logistics Engineering and Management,* Upper Saddle River, NJ: Prentice Hall

Blanchard, Benjamin, Dinesh Verma, Elmer L Peterson *Maintainability*, John Wiley & Sons and Sons

Frohne, Philip T., CPL, *Quantitative Measurements for Logistics,* New York, NY: McGraw-Hill SOLE Press

Glaskowsky, N.A., D Hudson, and R. M. Ivie, *Business Logistics*, New York: Dryden Press

Knezevic, Jezdimir, *Reliability, Maintainability, and Supportability*, McGraw Hill

Lewis, E.E., *Introduction to Reliability Engineering*, John Wiley & Sons

Miller, Irwin R, John E Freund, Richard Johnson, *Probability and Statistics for Engineers*, Prentice-Hall, Inc

Langford, John W, *Logistics Principles and Applications,* New York: McGraw Hill SOLE Press

Ostrofsky, Benjamin, *Design, Planning and Development Methodology,* Prentice Hall

The MIL standards for Reliability and Maintainability as well as Logistics Support Analysis will also help a great deal although there are no questions requiring the specs directly.

### 2.2.3 References for Part III of the CPL examination

Blanchard, Benjamin S., *Logistics Engineering and Management,* Upper Saddle River, NJ: Prentice Hall

Bowersox, Donald J. and D.J. Closs, *Logistical Management,* New York: McGraw Hill

Evans, James R., *Production/Operations Management*, West Publishing Company

Frohne, Philip T., CPL, *Quantitative Measurements for Logistics,* New York, NY: McGraw-Hill SOLE Press

Glaskowsky, N.A., D Hudson, and R. M. Ivie, *Business Logistics,* New York: Dryden Press

Hillier, Frederick S. and Gerald J Lieberman, *Introduction to Operations Research.* McGraw Hill

Lambert, Douglas M., James R. Stock, and Lisa M Ellram, *Fundamentals of Logistics Management,* Boston: McGraw Hill

Langford, John W, *Logistics Principles and Applications,* New York: McGraw Hill SOLE Press

The MIL standards for Provisioning and Cost Analysis as well as Logistics Support Analysis will also help a great deal although there are no questions requiring the specs directly.

### 2.2.4 References for Part IV of CPL Exam

Bowersox, Donald J. and David J. Closs, *Logistical Management*, New York, NY: McGraw-Hill

Coyle, John J., Edward J. Bardi and C. John Langley, Jr., *The Management of Business Logistics,* Minneapolis/St. Paul, MN: West Publishing

Frohne, Philip T., CPL, *Quantitative Measurements for Logistics,* New York, NY: McGraw-Hill SOLE Press

Lambert, Douglas M., James R. Stock, and Lisa M Ellram, *Fundamentals of Logistics Management,* Boston: McGraw Hill

Langford, John W, *Logistics Principles and Applications,* New York: McGraw Hill SOLE Press

Leenders, Michael and Fearon, Harold E, *Purchasing Materials Management*, Burr Ridge, IL Irwin: McGraw-Hill

Robeson, James F. and William C. Copacino, eds., *The Logistics Handbook*, New York, NY: The Free Press

Tompkins, James A. and Dale Harmelink, eds., *The Distribution Management Handbook*, New York:, NY McGraw-Hill

### 2.2.5 Additional references for all parts of the exam:

There are a number of journals where logistics articles are published that provide a state-of-the-art perspective on logistics topics. While a listing of the specific articles is enormous, the journals that would include items are:

**Academic/Professional Journals**

Journal of Business Logistics
International Journal of Physical Distribution and Logistics Management
The International Journal of Logistics Management
Transportation Journal
Logistics and Transportation Review
Harvard Business Review
Sloan Management Review
Business Horizons

**Trade Journals**

Logistics Spectrum
Logistics Management
Distribution Management
Handling & Shipping Management
Modern Materials Handling

**Proceedings of Conferences**

Council of Logistics Management Annual Conference
SOLE Annual Symposiums

There are a number of books that deal with specific logistics topics, which might also be helpful. Again the list is quite large, but the topics include customer service, supply chain management, quality, reengineering, JIT, EDI, reverse logistics, etc.

Examples of organizations that publish a number of research reports and books that deal with a variety of logistics topics include:

- Council of Supply Chain Management Professionals (CSCMP)
- Warehousing Education and Research Council (WERC)
- American Production & Inventory Control Society (APICS)
- American Society of Transportation & Logistics (ASTL)

You can contact those organizations directly for a listing of their publications.

## 2.3 Examination Content Overview

### Part One - Systems Management

- Basic Definition of Logistics Systems and Interfaces
- The Life Cycle Process
- Life Cycle Costs
- System Evaluation Factors
- Financial Methods
- Management Information Systems
- Logistics Planning
- Logistics Planning Implementation Methods
- Proposals, Source Selection, and Contract Negotiations
- Organization for Logistics
- Staffing the Organization
- Directing the Organization
- Controlling the Organization
- Basic Concept of Systems and Logistics
- System Hardware and Software
- Principles and Functions of Management
- Logistics Support

### Part Two - System Design and Development

- Design Process
- Conceptual Design
- Preliminary System Design
- Detailed Design
- Design Support Decisions
- Reliability
- Availability
- Maintainability
- Principles of Statistics
- Operational Research Techniques
- Forecasting Methods
- Engineering Economy Analysis
- Design Review Principles and Systems
- Test and Evaluation Principles and Plans
- System Test and Evaluation

## Part Three - Acquisition and Product Support

- Requirements for Support
- Cost Analysis and Source Selection
- Provisioning
- Contract Forms and Types
- Warranty Types
- Production Requirements
- Production Planning
- Production and Plant Engineering
- Manufacturing Engineering
- Methods Engineering and Management
- Inventory Policy Decisions
- Queuing and Machine Loading
- Equipment Replacement
- Sequence and Scheduling Models
- Forecasting Models

### Part Four - Distribution and Customer Support

- Physical Distribution Management
- The US Distribution System
- Contractual Requirements
- Field Engineering
- Maintenance Shop Operations
- Storage and Handling
- Warehousing
- Quality Assurance
- Materials Management
- Packaging and Handling
- Transportation Modes
- International Logistics
- Customer Service
- Life Cycle Assessment
- Reverse Logistics
- Purchasing and Procurement
- Supply Chain Management
- Strategic Alliances and Partnerships
- Outsourcing
- Logistics Organizations and Human Resource Issues
- Order Processing
- Use of Technology and Information Systems

# Part 3 - Practice Examinations

The following four sections provide questions that are generally at the level that one can expect on the examination. Since the examination is comprehensive in nature and covers a large area of Logistics Knowledge no short practice exam can completely represent the actual examinations.

THE CERTIFIED PROFESSIONAL LOGISTICIAN

CPL

# MINI - - EXAM

# PART I

# SYSTEMS MANAGEMENT

1. What is one advantage of a perpetual inventory system?

   a. Ability to review transactions in real time

   b. Ability to refine statistical forecasts through summary data

   c. Ability to review production schedules

   d. Ability to use EOQ under conditions of uncertainty

2. The major elements of Logistics Support are:

   a. Maintenance planning; supply support; test and support equipment; packaging, handling, storage, and transportation; personnel and training; facilities; data; and computer resources.

   b. Maintenance planning; supply support; test and support equipment; packaging, handling, storage and transportation; personnel and training; facilities; and computer resources.

   c. Maintenance planning; supply support; test and support equipment; packaging, storage and transportation; personnel and training; facilities; data; and computer resources.

   d. Maintenance planning; supply support; test and support equipment; packaging; storage and transportation; personnel and training; facilities; data; and computer resources.

3. The lowest level of economic integration, where you find the elimination of tariffs among the countries in a regional group and establishment of a common external tariff, and is called a:

   a. Customs Union.

   b. Common Market.

   c. Economic Union.

   d. Free-Trade Area.

4. Endogenous variables are elements:

   a. Within the system that the Logistician cannot control.

   b. Within the system that the Logistician can control.

   c. Outside the system that the Logistician cannot control.

   d. Outside the system that the Logistician can control.

5. A set of objects and/or characteristics with relationships among them and their attributes is called a:

   a. Structure.

   b. System.

   c. Morphology.

   d. Composite.

6. Design review and evaluation provides a:

   a. Formalized check, common baseline, formalized record, mature design, and a solution to interface problems.

   b. Formalized check, formalized record, mature design, and a solution to interface problems.

   c. Formalized check, common baseline, formalized record, and a solution to interface problems.

   d. Formalized check, common baseline, formalized record, and a mature design.

7. Life Cycle Costs involves the following costs associated with the system life cycle:

   a. Research and development, production and construction, operation and maintenance, modification and refurbishment.

   b. Research and development, production and construction, operation and maintenance, system requirement and phase out.

   c. Research and development, test and evaluation, operation and maintenance, system retirement and phase out.

   d. Research and development, test and evaluation, operation and maintenance, modification and refurbishment.

8. Three types of distribution structures are associated with warehousing. One of them is:

   a. Vicinity positioned

   b. Market positioned

   c. Movement positioned

   d. Storage positioned

9. A data communication system is:

   a. A group of machines whose primary purpose is to transfer digital data between two or more terminals at high speed.

   b. A group of machines whose primary purpose is to transfer digital data between two or more terminals in a reliable manner.

   c. A combination of people and machines whose primary purpose is to transfer digital data between two or more terminals in a reliable manner.

   d. A combination of people and machines whose primary purpose is to transfer digital data between two or more terminals at high speed.

10. Weber's Material Index relates to which of the following:

   a. Selling the obsolete system to a foreign country.

   b. Hoover's Transfer Costs

   c. Determination of market boundaries as measured by transportation costs

   d. Free trading analysis

11. Systems may be:

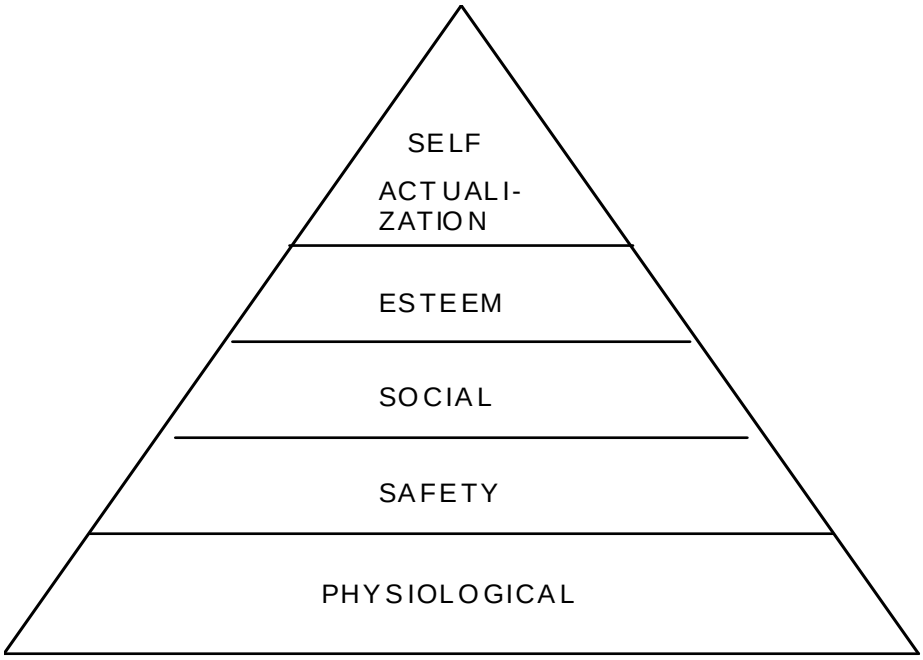
   a. Concrete or abstract.

   b. Only concrete.

   c. Only abstract.

   d. Neither concrete nor abstract.

12. According to Maslow's hierarchy of human needs,




HIERARCHY OF HUMAN NEEDS

The SOCIAL level of human needs encompasses:

a. Affection, Acceptance, Friendship, Esteem from Others, Sex.

b. Survival, Hunger, Thirst, Self-esteem.

c. Protection from Physical Harm.

d. Affection, Acceptance, Friendship, Belongingness, Love.

13. A “therblig” represents:

    a. A unit of work.

    b. A unit of the software item configuration baseline.

    c. Gilbreth spelled backwards.

    d. Both “a” and “c” are correct.

14. The two classifications of legal systems of which the logistics manager should be aware when working in a multinational environment are:

    a. English Law and Common Law.

    b. Civil Law system and the Continental Law system.

    c. English Law and the Civil Law system.

    d. Unified International Legal system and International Commercial Code of Trade.

15. Electronic Data Interchange for Administration, Commerce and Transportation (EDIFACT) Level Syntax Rules is the focus of the following International Standards Organization (ISO) document:

    a. ISO 9735.

    b. ISO 10179.

    c. ISO 10744.

    d. ISO 8879.

16. Logistics, and particularly transportation, has a number of inherent utilities. Which of the following is NOT one of these utilities.

    a. Place utility

    b. Personal utility

    c. Time utility

    d. Geographic specialization

17. A global information infrastructure linking customers and suppliers into virtual enterprises than can rapidly share business and technical documentation on product and process specifications and their support requirements, to collaborate on new product development and engineering changes, to exchange product/process data for manufacturing operations, and to coordinate technical data packages is best described as:

    a. Global INTERNET Integration.

    b. High Technology Transfer Protocol System.

    c. IETM Inter-operability.

    d. Electronic Commerce.

18. 18. Which is a typical concern of top-level management when implementing an integrated logistics system in their firm?

    a. Unity of command

    b. Span of control

    c. Authority

    d. All of the above

19. A product-oriented management tool, which is based on an infrastructure composed of hardware, software, services and data, and which completely defines a program or project is known as the:

    a. Critical Path Network.

    b. Work Breakdown Structure.

    c. Engineering Drawings Family Tree.

    d. Product Configuration Baseline.

20. Air transportation would be a suitable mode for which of the following products.

    a. Electronic commodities such as televisions

    b. Sand and gravel

    c. Flowers from South America

    d. Furniture

21. In the United States the Corporate form of legal organization accounts for approximately:

    a. 50% of the businesses and 75% of the sales.

    b. 25% of the sales and 67% of the businesses.

    c. 69% of the businesses and 50% of the sales.

    d. 25% of the businesses and 67% of the sales.

22. The "Theory X" vs. "Theory Y" management concept was formulated by:

    a. Douglas McGregor.

    b. Elton Mayo.

    c. Rensis Likert.

    d. Frederick Herzburg.

23. The predominant form of legal business organization in the United States is:

    a. Partnership.

    b. Corporation.

    c. Sole Proprietorship.

    e. Other forms.

24. Among the major factors which influence the role of logistics in a business organization are:

    a. Type of business transacted and importance of logistics costs.

    b. Need for trade-offs among logistics cost categories and complexity of the logistics network.

    c. Nature of corporate strategy and capabilities of the logistics managers.

    d. All of the above answers are correct.

25. The most common structural form of organization is:

    a. Project.

    b. Matrix.

    c. Integrative.

    d. Bureaucratic.

26. The acronym “IT” most commonly represents:

    a. Intelligence Team.

    b. Information Technology.

    c. Interactive Telecommunications.

    d. INTERNET Throughput.

27. Which of the following statements on Total Quality Management is not true?

    a. Under TQM everyone is responsible for quality.

    b. The philosophy of TQM predicates that quality cannot be inspected into a product.

    c. “Respect for people” is an important element of TQM implementation.

    d. TQM focuses on management of the product - not the total process.

28. The Father of Scientific Management and Industrial Engineering is considered to be:

    a. Henry Gantt.

    b. Frank Gilbreth.

    c. Frederick Taylor.

    d. Elton Mayo.

29. Under a normal distribution, what percentage of events is within $\pm$ 1 $\sigma$ of the mean.

    a. 34.1

    b. 68.3

    c. 47.7

    d. 99.7

30. The classifications of models used to aid decision-making are:

    a. Physical; Analog; Algorithmic and Mathematical.

    b. Digital; Analog; Algorithmic and Mathematical.

    c. Physical; Analog; Schematic and Diagrammatic.

    d. Physical; Analog; Schematic and Mathematical.

THE CERTIFIED PROFESSIONAL LOGISTICIAN

CPL

# MINI - - EXAM

# PART II

# SYSTEMS DESIGN AND DEVELOPMENT

1. The maintenance concept delineates:

   a. The anticipated levels of maintenance, general overall repair policies, the organization responsibilities for maintenance, the major elements of logistic support, the effectiveness requirements associated with the maintenance environment.

   b. The anticipated levels of maintenance, general overall repair policies, the organization responsibilities for maintenance, the major elements of logistic support, the effectiveness requirements associated with system support and the maintenance special tools and test equipment.

   c. The anticipated levels of maintenance, general overall repair policies, the organization responsibilities for maintenance, the maintenance facilities, the effectiveness requirements associated with system support and the maintenance special tools and test equipment.

   d. The anticipated levels of maintenance, general overall repair policies, the organization responsibilities for maintenance, the major elements of logistic support, the effectiveness requirements associated with system support and the maintenance environment.

2. Tactual displays

   a. Presume that all pats of the human hand have equal sensitivity.

   b. Optimize the capabilities of the human cutaneous (or somosthetic) senses.

   c. Depend on the human olfactory senses.

   d. Have greater effectiveness and utility at lower temperatures.

3. The aggregate probability of occurrence of the individual events that creates a specific hazard is termed as:

   a. Hazardous event probability.

   b. Hazard probability.

   c. Design risk.

   d. Hazard severity.

4. Availability is a function of:

   a. Reliability and Supportability.

   b. Reliability and Maintainability.

   c. Reliability and Failure Rate.

   d. Reliability and Reliability Apportionment.

5. When dealing with Human Factors in Systems consideration must be given to the following factors:

   a. Human sensory, anthropometic, physiological and psychological.

   b. Human sensory, environmental, physiological and psychological.

   c. Human sensory, anthropometic, physiological and physical.

   d. Human sensory, anthropometic, safety and psychological

6. The _____distribution is continuous and can be used for increasing or decreasing failure rates.

   a. Exponential

   b. Poisson.

   c. Weibull.

   d. Hypergeometric.

7. _____ = MTBM/(MTBM + MDT)

   a. Operational availability.

   b. Inherent availability.

   c. Achieved availability.

   d. Normal availability.

8. Primary input to maintainability analysis includes the following types of information:

   a. Operational support concepts and requirements; overall quantitative maintainability requirements; personnel subsystem limitations, characteristics, and description; projected facility, training program, and tool availability; cost constraints; studies and reports for the system; and standard tools and equipment.

   b. Operational support concepts and requirements; overall performance requirements; personnel subsystem limitations, characteristics, and description; projected facility, training program, skills, equipment and tool availability; cost constraints; studies and reports for the system; and standard tools and equipment.

   c. Operational support concepts and requirements; overall quantitative maintainability requirements; personnel subsystem limitations, characteristics, and description; projected facility, training program, skills, equipment, and tool availability; cost constraints; studies and reports for the system; and standard tools and equipment.

   d. Operational support concepts and requirements; overall quantitative maintainability requirements; personnel subsystem limitations, characteristics, and description; projected facility, training program, skills, equipment, and tool availability; environmental constraints; studies and reports for the system; and standard tools and equipment.

9. Preventive Maintenance is:

   a. The scheduled actions accomplished to retain a system at a specified level of performance by providing systematic inspection, detection, calibration, condition monitoring, and/or replacement of critical items to prevent impending failures.

   b. The scheduled actions accomplished to restore a system at a specified level of performance by providing systematic inspection, detection, servicing, calibration, condition monitoring, and/or replacement of critical items to prevent impending failures.

   c. The scheduled actions accomplished to retain a system at a specified level of performance by providing systematic inspection, detection, servicing, calibration, condition monitoring, and/or replacement of critical items to prevent impending failures.

   d. The scheduled actions accomplished to restore a system at a specified level of performance by providing systematic inspection, detection, calibration, condition monitoring, and/or replacement of critical items to prevent impending failures.

10. LSA is a process employed on an iterative basis throughout system development. Its main objectives are to aid in the:

    a. Initial establishment of supportability requirements, evaluation of system/equipment design configuration, and the evaluation of a given design configuration.

    b. Initial establishment of personnel, evaluation of system/equipment design configuration, evaluation of a given design configuration, and the measurement and evaluation of an operating system.

    c. Initial establishment of supportability requirements, evaluation of system/equipment design configuration, evaluation of a given design configuration, and the measurement and evaluation of an operating system.

    d. Initial establishment of supportability requirements, evaluation of system/equipment design configuration, evaluation of maintainability characteristics, and the measurement and evaluation of an operating system.

11. A system reflects $MTBM_{ct}$ of 1000 hours and $MTBM_{pt}$ of 250 hours.

    The system MTBM is:

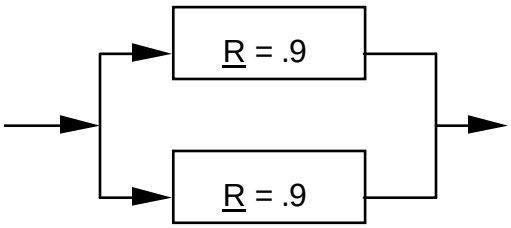
    a. 200 hours.

    b. 333 hours.

    c. 2000 hours.

    d. 150 hours.

12. Given the following Reliability Block Diagram:




The system Reliability is:

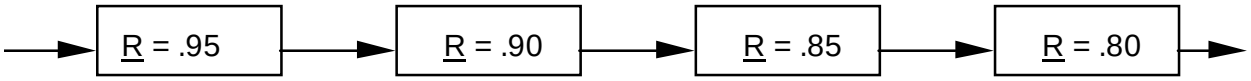
a. .96

b. .81

c. .9

d. .99

13. Given the following Reliability Block Diagram:




The system Reliability is:

a. 0.5814

b. 0.8514

c. 3.5

d. 0.875

14. Based on the following subsystem data:

| Subsystem Nr. | Subsystem $\bar{M}_{ct}$ | Subsystem Failure Rate |
|---|---|---|
| Subsystem 1 | 3.0 | 0.001 |
| Subsystem 2 | 2.5 | 0.0015 |
| Subsystem 3 | 2.0 | 0.002 |
| Subsystem 4 | 1.5 | 0.0025 |

The system $\bar{M}_{ct}$ is:

a. 0.207

b. 2.25

c. 2.07

d. 2.7

15. The system Failure Rate for the system described in Question 14 is:

a. 0.0145

b. 0.00175

c. 0.007

d. 0.145

16. If the system MTBM is 1000 and the MDT is 50, the Operational Availability ( $A_o$ ) is:

a. 0.95

b. 1.05

c. 0.59

d. None of the above.

17. Based on the following subsystem data:

| Subsystem Nr. | Subsystem MTBF |
|---|---|
| Subsystem 1 | 1500 |
| Subsystem 2 | 1200 |
| Subsystem 3 | 1000 |
| Subsystem 4 | 800 |

The system MTBF is:

a. 250

b. 255

c. 1125

d. 267

18. If the system design calls for MTBF of 1500 and $\bar{M}_{ct}$ of 2.5, the projected Inherent Availability

( $A_i$ ) of the system is:

a. 0.998

b. 0.984

c. 0.894

d. 0.989

19. The Target $A_i$ of a system is .999 and the maximum acceptable $\bar{M}_{ct}$ is 1.5 hours. The design MTBF must be a minimum of:

a. 1499 hours.

b. 150 hours.

c, 14985 hours.

d. None of the above.

20. A system is allocated a system level $\bar{M}_{ct}$ of 4.5 hours and has been estimated to have the following subsystem Reliability attributes:

| Subsystem Nr. | Subsystem Failure Rate |
|---|---|
| Subsystem 1 | 0.002 |
| Subsystem 2 | 0.004 |
| Subsystem | 0.006 |
| Subsystem 4 | 0.008 |

The Maintainability allocation of $\bar{M}_{ct}$ ( hours ) to each subsystem should be as follows:

| | | | | |
|---|---|---|---|---|
| a. | Subsystem 1: | 2.0 | Subsystem 3: | 7.0 |
| | Subsystem 2: | 5.0 | Subsystem 4: | 8.0 |
| b. | Subsystem 1: | 4.0 | Subsystem 3: | 12.0 |
| | Subsystem 2: | 8.0 | Subsystem 4: | 16.0 |
| c. | Subsystem 1: | 8.0 | Subsystem 3: | 5.0 |
| | Subsystem 2: | 7.0 | Subsystem 4: | 2.0 |
| d. | Subsystem 1: | 16.0 | Subsystem 3: | 8.0 |
| | Subsystem 2: | 12.0 | Subsystem 4: | 4.0 |

21. If the system MTBM is 800 hours and the $\bar{M}$ is 5 hours the Achieved Availability ( $A_a$ ) is:

a. 0.994

b. 0.949

c. 0.941

d. 0.999

**THE FOLLOWING APPLIES TO #22, #23, AND #24**

A System has the following specifications:

| | |
|---|---|
| $\bar{M}_{ct}$ (Hours): | 3.0 |
| $\bar{M}_{pt}$ (Hours): | 2.0 |
| $\bar{M}_{LD}$ (Hours): | 25.0 |
| MTBF (Hours): | 2,000 |
| $MTBM_{pt}$ (Hours): | 1,500 |
| MTBL (Hours): | 1,000 (Logistics Delay Interval) |

22. The System Failure Rate ($\lambda$), Preventive Maintenance Frequency ($f_{pt}$) and Logistics Delay Frequency ($f_{LD}$) are: respectively:

a. $\lambda$: .001
$f_{pt}$: .007
$f_{LD}$ : .005

b. $\lambda$: .0005
$f_{pt}$: .00067
$f_{LD}$: .0001

c. $\lambda$: .0005
$f_{pt}$: .00067
$f_{LD}$: .001

d. $\lambda$: .005
$f_{pt}$: .00067
$f_{LD}$: .001

23. The Mean Active Maintenance Time ($\bar{M}$) (hours) is:

a. 127.35

b. 13.97

c. 2.5

d. 2.427

24. The Maintenance Down Time (MDT) (hours) is:

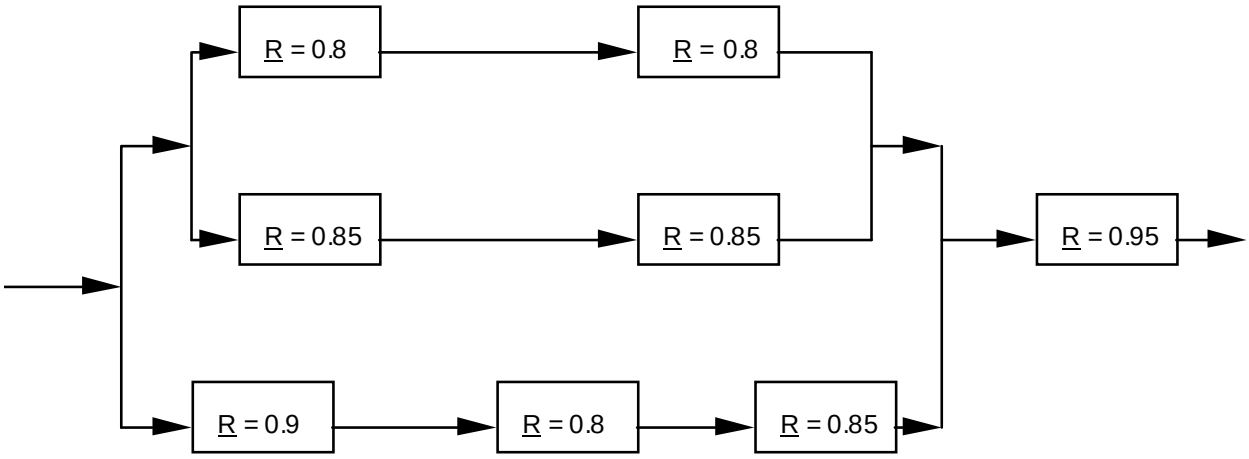
    a. 1.28

    b. 12.83

    c. 13.28

    d. 128.295

25. A subsystem is described by the following Reliability Block Diagram ( RBD ):




    The Reliability of the subsystem is:

    a. 0.95

    b. 0.612

    c. 0.9132

    d. 0.9612

**THE FOLLOWING APPLIES TO #26 AND #27**

A system has a target Reliability of 0.95; the projected MTBF is 10,000 hours and the planned Operating Cycle is 500 hours.

26. If the Reliability of 0.95 must be maintained, but the MTBF is reduced to 7,500 hours, the impact on the Operating Cycle would be:

    a. Reduction from 500 hours to 435 hours.

    b. Reduction from 500 hours to 385 hours.

    c. No effect.

    d. Reduction from 500 hours to 405 hours.

27. If the Reliability of 0.95 must be maintained, but it is planned to increase the operating cycle from 500 hours to 750 hours the Maintainability parameter would have to be redesigned by:

    a. Increasing MTBF from 10,000 hours to 14,622 hours.

    b. Reducing Failure Rate to $6839 \times 10^{-6}$.

    c. Increasing MTBF from 10,000 hours to 16,422 hours.

    d. Doing nothing; no redesign would be required.

28. The results of a Maintainability Demonstration document the following:

    $\bar{M}_{ct}$ : 25 minutes

    Sample size: 30 Task observations

    Sample Standard Deviation ($\sigma$): 3.2

    Confidence Factor: 95% (z = 1.65)

    The calculated Upper Limit is:

    a. 25.964

    b. 34.064

    c. 26.176

    d. 25.166

29. The following is a true statement:

a. Inherent Availability ( $A_i$ ) is sometimes greater than Achieved Availability ( $A_a$ ).

b. Operational Availability ( $A_o$ ) is sometimes greater than ( $A_i$ ) and always less than ( $A_a$ ).

c. Operational Availability ( $A_o$ ) is always less than ( $A_i$ ) and always less than ( $A_a$ ).

d. None of the above are correct statements.

30. A system has the following subsystem characteristics:

| Subsystem | Failures x $10^{-6}$ | Mean Corrective Maintenance Time ( $\bar{M}_{ct}$ ) |
|---|---|---|
| Subsystem 1 | 250 | 5.0 |
| Subsystem 2 | 375 | 4.0 |
| Subsystem 3 | 125 | 8.0 |
| Subsystem 4 | 500 | 2.0 |

The calculated system level $\bar{M}_{ct}$ would be:

a. 4.75

b. 3.8

c. 7.5

d. 3.5

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# MINI - - EXAM

# PART III

# ACQUISITION
# AND
# PRODUCTION SUPPORT

1. More than _____ of the world uses the metric measurement.

   a. 60%

   b. 70%

   c. 80%

   d. 90%

2. Maintenance planning defines the support requirements and plans for maintenance. Maintenance planning documentation should provide:

   a. Identification of tools, spares and repair parts, and technical data; qualification of maintenance support needs by time and place; personnel requirements analysis by skill, type and number, and facilities loading to establish adequacy and utilization.

   b. Identification of tools, test equipment, facilities, personnel, spares and repair parts; quantification of maintenance support needs by time and place; personnel requirements analysis by skill, type and number, and facilities loading to establish adequacy and utilization.

   c. Identification of tools, test equipment, facilities, personnel, spares and repair parts, and technical data; quantification of maintenance support needs by time and place; personnel requirements analysis by skill and type; and facilities loading to establish adequacy and utilization.

   d. Identification of tools, test equipment, facilities, personnel, spares and repair parts, and technical data; quantification of maintenance support needs by time and place; personnel requirements analysis by skill, type and number; and facilities loading to establish adequacy and utilization.

3. Potential logistics savings from _____ include resulting from a/an _____ in the number of inventoried items and from the shipment of _____ quantities.

   a. Rationalization; increase; smaller.

   b. Standardization; increase; smaller.

   c. Standardization; decrease; larger.

   d. Standardization; decrease; smaller.

4. The order point is:

   a. The moment in time when the committed quantity of inventory on hand has dropped to a specified level.

   b. The moment in time when the uncommitted quantity of inventory on had has dropped to a specified level.

   c. The moment in time when the committed quantity of inventory on hand has dropped to an unspecified level.

   d. The moment in time when the uncommitted quantity of inventory on hand has dropped to an unspecified level.

5. Based on the concept of the Double Sample Plan:

   a. If the cumulative number of defectives is equal to or less than the second acceptance number, the lot or batch is considered acceptable.

   b. Two samples are always required to ascertain acceptability of the lot or batch.

   c. The difference between the acceptance number and rejection number increases with successive samples.

   d. Both a and b are correct.

6. The production of multiple quantities of an item assumes a flow-shop pattern when:

   a. The output variety is limited and each kind of output follows the same basic path or sequence of processing steps.

   b. The output variety is limited and each kind of output follows a different path or sequences of processing steps.

   c. The output variety is varied and each kind of output follows the same basic path or sequences of processing steps.

   d. The output variety is varied and each kind of output follows a different path or sequence of processing steps.

7. The advantages of utilizing ABC TO CONTROL INVENTORY IS THAT IT:

   a. Concentrates attention on fast moving items, reduces stock outs and transportation costs with fewer emergency shipments, and it reduces overall logistics costs.

   b. Concentrates attention on very slow moving items, reduces stock outs and transportation costs with fewer emergency shipments, and it reduces overall logistics costs.

   c. Concentrates attention on fast moving items, reduces stock outs and transportation costs with fewer emergency shipments, and it reduces overall obsolescence costs.

   d. Concentrates attention on very slow moving items, reduces stock outs and transportation costs with fewer emergency shipments, and it reduces overall labor costs.

8. A _____ is a scheduling technique used mostly to show activity or job requirements, facility loading, and work status on a daily basis.

   a. PERT Chart.

   b. Gantt Chart.

   c. Flow Diagram

   d. Linear programming.

9. The probability that a lot is actually bad or faulty is accepted wherein the user is penalized is called:

   a. Producer's risk.

   b. Consumer's risk.

   c. Type III risk.

   d. b, and c.

10. TQM was a concept initiated by the:

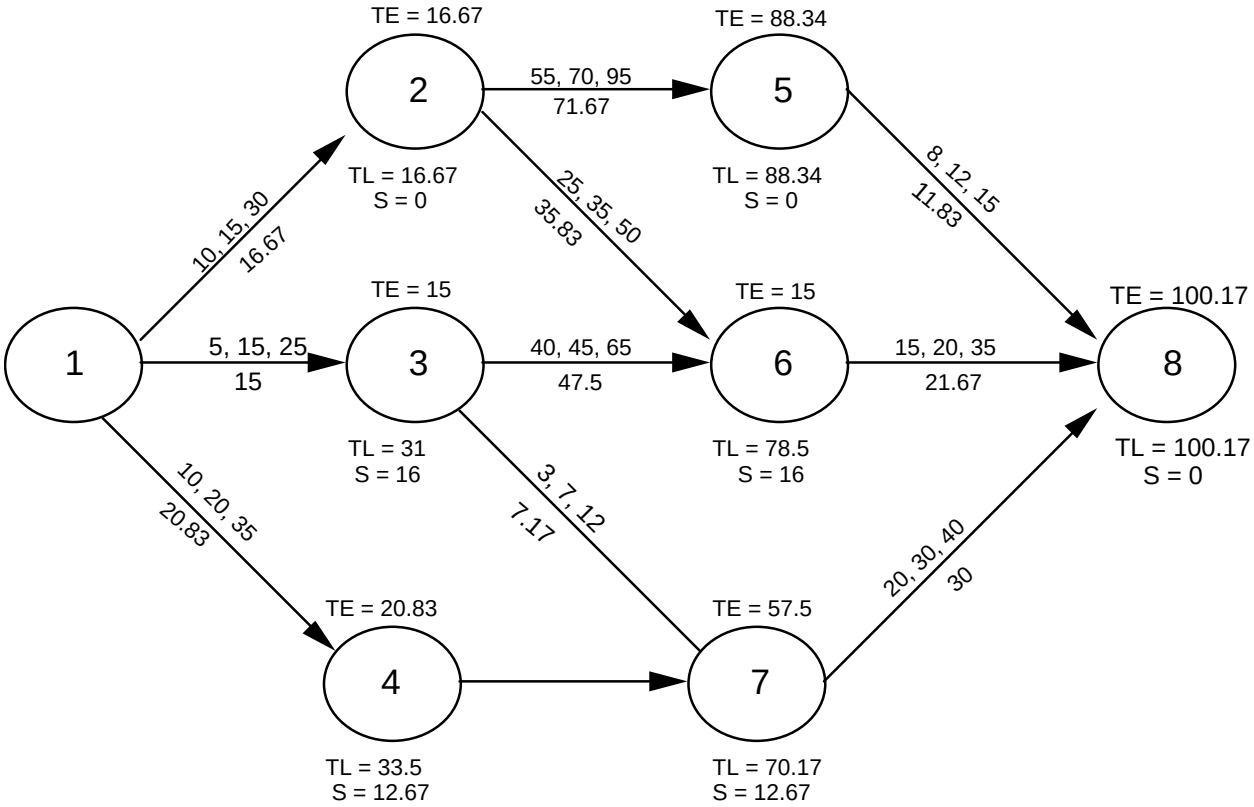
   a. US commercial sector.

   b. Department of Defense.

   c. Japanese commercial sector.

   d. European Economic Community.

11.




The Critical Path of this PERT network is described by the following events:

a. 1, 3, 6, 8.

b. 1, 3, 7, 8.

c. 1, 2, 5, 8.

d. 1, 4, 7, 8

12. In a manufacturing sequence of standard production items, the first unit costs $10.00 to produce; the 10th unit costs $9.00. The estimated production cost of the 40th unit should be:

a. $8.10

b. $7.29

c. $9.10

d. 6.56

The following applies to Questions #13 and #14.

An item of equipment is purchased for $11,500. The equipment is assigned a five year service life and the salvage value is determined to be $1,500.

13. Based on the straight-line method of depreciation, the annual depreciation would be:

    a. $2,300.

    b. $2,000.

    c. $4,600.

    d. $1,500.

14. Based on the double declining balance method of depreciation, the depreciation for the first year would be:

    a. $4,600.

    b. $2,300.

    c. $4,000.

    d. $5,000.

15. A commercial account credit card stipulates annual interest of 15%, compounded daily. The effective annual interest, based on daily compounding would most closely approximate:

    a. 15%.

    b. 15.6%.

    c. 16%.

    d. 16.2%.

16. The contractor or vendor assumes 100% of the technical, schedule and cost risk under the following form of contract:

    a. Fixed Price.

    b. Firm Fixed Price.

    c. CPIF.

    d. CPFF.

17. Given a five year cost stream, the present value of $5,000 total annual cost in year five from the present date, based on a projected 5% annual increase in the consumer price index, would most closely approximate:

    a. $3,918.

    b.. $4,000.

    c. $4,248.

    d. $3,891.

18. During a period of sustained annual increases in the wholesale price index, it is most likely that the following inventory management principles would be applied:

    a. LIFO would be used for inventory unit cost valuation and FIFO would be used for stock issue policy.

    b. FIFO would be used for inventory unit cost valuation and LIFO would be used for stock issue policy.

    c. FISH would be applied in both cases.

    d. None of the above is valid.

19. In a Critical Path Analysis network, the critical path is:

    a. Defined by the most time consuming chain of sequential, interactive events.

    b. Defined by the fastest time in which a project may be completed.

    c. The chain of sequential, interactive events in which each event has zero slack time.

    d. Answer "a", "b" and "c" are all correct.

20. If the annual demand for an item is 10,000 units and the order quantity is 2,000 units, the stock-turn rate would be:

    a. Four.

    b. Five

    c. Defined by 73 calendar days.

    d. Both "b" and "c" are correct.

21. Material Requirements Planning ( MRP I 0 consists primarily of all the following except:

    a. The preparation of a master production schedule for some period in the future.

    b. The preparation of a bill of materials of the item to be produced.

    c. The scheduling of component inventory replenishment, according to necessary lead times and economic order, buying or shipping quantities to conform with the requirements schedule rather than average demand.

    d. Consideration of planning relating to plant capacity.

22. A term of reference commonly used to parameterize unit of inventory accounting in commercial enterprises is the:

    a. SKU.

    b. EOQ.

    c. JIT.

    d. SKUL.

23. The predominate elements of inventory costs are all the following except:

    a. Order processing or order setup costs.

    b. Investment costs.

    c. Warehousing costs.

    d. Stock-out costs.

24. The design review that will focus on the acceptability of the detailed design, performance and test characteristics of the design solution, and on the adequacy of the functional and support documentation -with the goal of establishing the design baseline for detailed fabrication and production planning is the:

    a. System Design Review.

    b. Preliminary Design Review.

    c. Critical Design Review.

    d. Physical Configuration Audit.

25. In the process of Failure Modes and Effects Analysis, severity classifications Category I, Category II, Category III and Category IV are defined respectively as:

    a. Minor; Marginal; Critical; and Catastrophic.

    b. Catastrophic; Critical; Marginal; and Minor.

    c. Actual Loss; Probable Loss; Possible Loss; and No Effect.

    d. No Effect; Possible Loss; Probable Loss; and Actual Loss.

26. The total assets physically available to an inventory manager comprises:

    a. Normal operating level stocks; safety, or contingency, stocks; in-transit stocks; speculative stocks; and seasonal buffer stocks.

    b. Normal operating level stocks; safety, or contingency, stocks; in-transit stocks; procurement lead-time stocks; and dead stocks.

    c. Normal operating level stocks; safety, or contingency, stocks; in-transit stocks; speculative stocks; and EOQ stocks.

    d. Normal operating level stocks; safety, or contingency, stocks; in-transit stocks; speculative stocks; and dead stocks.

27. Given the following FMECA (MIL-STD-1629) outputs:

    a. $\beta = 0.80$

    b. $\alpha = 25\%$

    c. $\lambda_p = .001$

    d. $t = 500$

    The computed failure mode criticality number ( $C_m$ ) would be:

    a. 0.001.

    b. 0.01.

    c. 0.1.

    d. 10.0.

28. The following is a true statement with respect to software reliability:

    a. Failures are primarily due to design errors, with production (duplicating), use and program maintenance having a negligible effect.

    b. Failures can be related to the passage of operating or storage time.

    c. Failures can be caused by deficiencies in design, production, use and maintenance.

    d. Failures can be due to wear or other energy-related phenomena.

29. A unit of production equipment is acquired for $10,000 with a loan for the total purchase, repayable in five years at 7% annual interest. How much must be paid into the sinking fund at the end of each year to amortize the purchase?

    a. $2,140.

    b. $2,439.

    c. $2,700.

    d. $2,000.

30. It is necessary to negotiate a final unit price for a contract for production of 3,000 widgets. The computed average cost on an initial pilot program of 50 units was $10,000 and the learning curve factor was calculated to be 90%. The final average unit cost negotiated for the production contract for 3,000 units should be:

    Note: $\bar{C}_{X2} = \bar{C}_{X1} \left(\frac{X_2}{X_1}\right)$ **logS/Log2**

    a. $5.37.

    b. $5.15.

    c. $6.12.

    d. $4.96.

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# MINI - - EXAM

# PART IV

# DISTRIBUTION AND CUSTOMER SUPPORT

1. Logistics expenditures in the US amount to approximately _____ of the GNP.

   a. 5%

   b. 10%

   c. 20%

   d. 1%

2. Distribution is defined as the:

   a. Process of managing the flow of finished goods in a firm including the activities of warehousing, order processing, inventory control, packaging, materials handling, transportation and product disposal.

   b. Process of managing the flow of raw materials and finished goods in a firm including the activities of warehousing, order processing, inventory control, packaging, materials handling, and transportation.

   c. Process of managing the flow of finished goods in a firm including the activities of warehousing, order processing, inventory control, packaging, materials handling, and transportation.

   d. Process of managing the flow of finished goods in a firm including the activities of warehousing, order processing, inventory control, packaging, materials handling, transport, and product disposal.

3. _____ is a method of relating products to one another for transportation purposes.

   a. Classification.

   b. Class rates.

   c. a. and b.

   d. Commodity rates.

4. Transportation costs include:

   a. Fully distributed costs; fixed costs; variable costs; out-of-pocket costs; and joint costs.

   b. Fully distributed costs; fixed costs; variable costs; expense costs; and joint and common costs.

   c. Fully distributed costs; fixed costs; labor costs; out-of-pocket costs; and joint costs.

   d. Fully distributed costs; fixed costs; variable costs; out-of-pocket costs; and joint and common costs.

5. Logistics costs, as a percentage of the sales dollar will increase under which the following conditions:

   a. Orders decrease, average value per order item decreases, number of shipments required to supply all items decreases, number of administrative points through which the item must be processed increases, number of points that the item must pass through physically to reach the customer increases, and there are no severe peak requirements for processing orders or shipments over time.

   b. Orders decrease, average value per order item decreases, number of shipments required to supply all items increases, number of administrative points through which the item must be processed increases, number of points that the item must pass through physically to reach the customer increases, and there are severe peak requirements for processing orders or shipments over time.

   c. Orders decrease, average value per order item increases, number of shipments required to supply all items increases, number of administrative points through which the item must be processed increases, number of points that the item must pass through physically to reach the customer increases, and there are severe peak requirements for processing orders or shipments over time.

   d. Orders decrease, average value per order item decreases, number of shipments required to supply all items increases, number of administrative points through which the item must be processed increases.

6. The Bill of Lading provides:

   a. A contract for the movement of a shipment, a receipt for goods itemized on it, and a certificate of title for the goods.

   b. A contract for the movement of a shipment and a certificate of title the goods.

   c. A contract for the movement of a shipment, in some cases a receipt for goods itemized on it, and in some cases a certificate of title for the goods.

   d. A contract for the movement of a shipment, a receipt for goods itemized on it, and in some cases a certificate of title for the goods.

7. Where product maintenance is important, suppliers are often judged in part on the _____ of their service programs. This includes the _____ offered to ultimate users of the product as well as the _____ and _____ of service and repair networks.

   a. Quality, warranty, quality, convenience

   b. Depth, warranty, efficiency, effectiveness

   c. Quality, incentive, quality, convenience

   d. Breadth, incentive, quality, convenience

8. The Marketing Mix is based on:

   a. Product, Promotion, Pay, Place.

   b. Product, Production, Price, Place.

   c. Product, Promotion, Price, Place.

   d. Product, Production, Price, Place.

9. In the US many logistics legal concerns are addressed by the:

   a. Logistics Act of 1950.

   b. Uniform Commercial Code.

   c. Commercial Logistics Act.

   d. a. and b.

10. Examples of possible pallet patterns include:

    a. Block, split block, brick.

    b. Row, split row, pinwheel.

    c. a. and roman square.

    d. a. and b.

11. Environmental considerations have become a matter of increasing concern in our society. The two aspects of this emerging environmental situation for packaging engineers are:

    a. Biodegradability and recyclability

    b. Disposability and biodegradability

    c. Recyclability and disposability

    d. Compactability and biodegradability

12. GIVEN:

$$Q^* = \sqrt{\frac{2C_pD}{C_h}}$$

If the Procurement costs are reduced by 50%, the Holding cost doubled, and the Demand increased by a factor of 400%, the Economic Order Quantity would:

    a. Double.

    b. Triple.

    c. Remain unchanged

    d. Quadruple.

13. A group of firms, manufacturers, wholesalers and retailers who coordinate the movement of goods and services from the point of supply to the point of demand is described as the:

    a. Transportation consortium

    b. Distribution channel.

    c. Industrial cartel

    d. Logistics chain.

14. The most important function of packaging is:

    a. Protection.

    b. Promotion.

    c. Identification.

    d. Facilitate handling and storage of the product.

15. If 20% of the inventory of a company represented 80% of their sales, this group of item would be classified as follows, based on the ABC model:

    a. C.

    b. B.

    c. A.

    d. A and/or B.

16. "Kanban" is:

    a. An in-plant production control technique for minimizing capital invested in parts inventories.

    b. An in-plant production control technique for minimizing capital invested in in-process parts inventories.

    c. An in-plant production control technique for minimizing capital invested in all inventories.

    d. production control technique for minimizing capital invested in inventories awaiting shipment.

17. The primary economic factors considered in determination of the optimum location of a production facility are all the following except:

    a. Costs of transfer if raw materials and working stocks from the sources to the production plant.

    b. Costs of transfer of finished products from the production plant to market centers.

    c. Procurement costs based on EOQ computations.

    d. Production costs (labor, taxes, utilities, facility costs, etc.) at the plant site.

18. The isodapane is best described as:

    a. Cartographic portrayal of boundary lines developed from confluences of the isotims of a multiplicity of locations.

    b. Cartographic display of a candidate site location as a central point surrounded by concentric dotted circles.

    c. A Cartographic plot based on calculation of the effects of incremental unit transportation costs.

    d. Both "a" and "c" are correct.

19. Increasing the number of warehouse locations within a market zone tends to:

    a. Increase product delivery times and redact distribution costs.

    b. Reduce product delivery times and increase distribution costs.

    c. Enhance responsiveness to customers through reduction in unit cost of the product.

    d. Both "a" and "c" are correct.

20. The legal forms of carriers in the U.S. transportation industry are:

    a. Common; contract; exempt; and private

    b. Rail; highway; water; pipeline; and air

    c. Common; contract; interstate; and intrastate

    d. Auxiliary users; shipper associations; freight forwarders; and common carriage

21. The term “demurrage” applies to:

    a. Rail and water transportation.

    2. Rail, water and pipeline transportation.

    c. Rail, water, highway and pipeline transportation

    d. Rail, water, highway, air and pipeline transportation

22. The ranking of the operational modes of transportation, with respect to dependability, is in descending order:

    a. Air; highway; rail; water; and pipeline

    b. Water; rail; highway; air; and pipeline

    c. Pipeline; highway; rail; water; and air

    d. Highway; air; rail; water; and pipeline

23. Based on distribution of cargo traffic, the most popular mode of transportation in terms of utilization of ton-miles is:

    a. Highway.

    b. Water.

    c. Rail.

    d. Pipeline.

24. In a materials handling system, the least expensive form of energy would be an attribute of:

    a. Manual systems.

    b. Mechanized systems.

    c. Computerized systems.

    d. Gravity flow systems.

25. The most common pallet size is:

    a. 40in X 48in.

    b. 48in X 48in.

    c. 40in X 32in.

    d. 36in X 48in.

26 Warehouses are legally defined as:

    a. Field warehouses and bonded warehouses.

    b. Public warehouses and private warehouses.

    c. Commodity warehouses and bulk storage warehouses.

    d. Household goods warehouses and general merchandise warehouses.

27. All the following statements with respect to exempt carriers are true except:

    a. Require no economic regulation.

    b. Are so classified because of products carried, territory served, or organization formed.

    c. Assume no obligation to provide regular service.

    d. Are exempt from intensive safety regulation.

28. Classification of freight for the purpose of determining transportation charges is determined by the following factors:

    a. Density; stowability; fragility; and environmental impact.

    d. Density, stowability; handling; and liability

    c. Density, handling' flammability and perishability

    d. Density; stowability; liability; and value per pound

29. The coordination of intermodal truck and water service is referred to as:

    a. Truck-water.

    c. COPF

    c. "Fishyback".

    d. Both "a" and "c" are correct.

30. The Federal agency responsible for economic regulation of water carriers in foreign trades and between the United States and its possessions, terminal operators and ocean freight forwarders is the:

    a. Interstate Commerce Commission.

    b. Federal Maritime Administration

    c. Federal Maritime Commission.

    d. Both "b" and "c" are correct.

## CPL MINI-EXAM SOLUTION MATRIX

| QUESTION | PART I | PART II | PART III | PART IV |
|---|---|---|---|---|
| 1 | **a** | **d** | **d** | **c** |
| **2** | **a** | **b** | **d** | **a** |
| **3** | **a** | **b** | **c** | **c** |
| **4** | **b** | **b** | **b** | **d** |
| **5** | **b** | **a** | **a** | **d** |
| **6** | **a** | **c** | **a** | **d** |
| **7** | **b** | **a** | **a** | **a** |
| **8** | **b** | **c** | **b** | **c** |
| **9** | **c** | **c** | **b** | **b** |
| **10** | **c** | **c** | **b** | **d** |
| **11** | **a** | **a** | **c** | **a** |
| **12** | **d** | **d** | **b** | **c** |
| **13** | **d** | **a** | **b** | **b** |
| **14** | **c** | **c** | **a** | **a** |
| **15** | **a** | **c** | **d** | **c** |
| **16** | **b** | **a** | **b** | **b** |
| **17** | **d** | **d** | **a** | **c** |
| **18** | **d** | **a** | **a** | **d** |
| **19** | **b** | **a** | **d** | **b** |
| **20** | **c** | **c** | **d** | **a** |
| **21** | **d** | **a** | **d** | **b** |
| **22** | **a** | **c** | **a** | **c** |
| **23** | **c** | **d** | **d** | **c** |
| **24** | **d** | **b** | **c** | **d** |
| **25** | **d** | **c** | **b** | **a** |
| **26** | **b** | **b** | **d** | **b** |
| **27** | **d** | **a** | **c** | **d** |
| **28** | **c** | **a** | **a** | **b** |
| **29** | **b** | **c** | **b** | **d** |
| **30** | **d** | **b** | **a** | **c** |
| | | | | |