

PROGRAM SUMMARY and STUDY GUIDE
CONFIGURATION and DATA MANAGEMENT
CERTIFICATION

NDIA

National Defense Industrial Association



NDIA Technical Information Division

National Defense Industrial Association
Technical Information Division
Professional Certification Section
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This document contains summary information and study guidance for individuals preparing for the NDIA Professional Certification Examination in Configuration and Data Management. It is not to be construed as a complete guide, or as a guarantee of success in the examination.

FOREWORD

This document summarizes the NDIA Certification Program and includes the examination study guide to help individuals prepare for the Configuration and Data Management (CDM) Professional Certification. The study guide lists, but does not include, references used as a basis for the examination. Whether you are preparing for the Manager, Specialist, or Apprentice Examination, the study guide can assist you, and **it is in your interest to review it prior to initiating study.**

Many references should be available from the **technical library at the organization where you work**, from the sponsoring industry organization, or may be ordered from Global Engineering Documents in Englewood, CO. DOD and MIL documents may be downloaded from their website or the ASSIST Database at **www.DODssp.daps.mil** or at <http://www.dsp.dla.mil/>.

This document will be updated on an annual basis (December) when significant additions/deletions or changes are required to assure current information is provided to the receipts of the information herein.

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CDM CERTIFICATION

Program Highlights

- **Combined configuration and data management certification reflecting global trends**
- **Focus on configuration and data management in commercial, government and international applications with significant data management emphasis**
- **Examinations based on Industry, Government and International Guidance Standards which form the basis for current CDM processes**
- **A *recertification* process providing currency options for previously certified professionals**
- **Scheduled certification preparation courses in conjunction with NDIA supported CDM focused conferences**
- **Examinations available on request at specified United Kingdom locations**
- **Available on-site Preparation Course and Certification Examinations**
- **An Apprentice Program that provides formal recognition for those new in the CDM discipline**
- **CDM entry level examination based on Industry, Government, and International standards, which are the foundation of current CDM processes**

NDIA Certification Program Summary

WHY CDM CERTIFICATION?

The configuration and data management disciplines are critically important in the design, development, production, test, Integration and maintenance of complex products. These disciplines are vital and have many applications globally in both commercial and government applications. Most organizations recognize CDM processes as keystones in two of the most critical business requirements; **managing risk and controlling cost**. Thus, more often than not, CDM is a “value added” essential part of business.

Accordingly, a reliable means to identify and recognize well-qualified, experienced configuration and data management professionals is essential to establish professionalism in these disciplines. The NDIA Technical Information Division (TID) initiated CDM certification in 1990; and continues to be the CDM certification program most recognized and respected for its adherence to qualifying candidates according to high standards in terms of experience and knowledge. During 1990, a one-time ‘Grandfather’ program provided a vehicle for NDIA to certify individuals who had qualifying ‘lifetime experience’ of at least fifteen years direct experience in CM and DM, and a four-year college degree. More than 200 CM and DM professionals were approved as Certified Configuration Managers (CCM) and Certified Data Managers (CDM). In 2000, NDIA certification was conducted in the UK, and has continued to expand each year. Since 1991, certifications have been earned by successful completion of examinations by those who have the required experience.

Not surprisingly, many individuals are seeing the CDM discipline as an avenue for applying their talents in the business world. Accordingly, the NDIA Technical Information Division has established a CDM Apprentice program that provides a method for entry-level individuals to be designated a **CDM Apprentice**, which sets up a progression ladder leading toward CDM Certification after attaining the NDIA experience requirements for certification. This also will allow those entering the discipline to become knowledgeable of all aspects of CDM and a basis to determine if they desire to continue in the discipline.

PROGRAM ENHANCEMENTS

During the past few years, significant changes have taken place in DOD, NASA and commercial acquisition processes. DOD reform has focused on reducing reliance on DOD/MIL specifications and standards, increasing use of performance specifications, and emphasizing cost savings associated with the use of Commercial off the Shelf (COTS) and Non-Developmental Items (NDI). In a parallel manner, there have been significant increases in commercial CDM applications, many associated with the global industry use of ISO Quality Management Standards, (which have considerable focus on configuration and data management) as well as EIA 649, Consensus Standard for Configuration Management, and the ISO/IEC 12207 series, Software Life Cycle Processes. Many of these guidance documents actually form the basis of currently used CDM processes. Of course, all of these changes are driven by the need to be cost competitive.

Reflecting on these on-going changes, the NDIA Technical Information Division certification program is updated to be consistent with recognized changes. New or

revised Industry, Government and International Standards are included, normally following the year in which they are released. Examination questions are heavily weighted toward generic CDM, rather than focusing on government contract CDM; however, the majority of the individual that apply for the NDIA CDM Certification work government contracts. In addition, as configuration and data management processes have become more world-wide in scope, NDIA certification is offered internationally, with specific concentration in the United Kingdom. Many industry based CDM processes developed and currently used commercially and on government contracts in the US have been incorporated in international applications. Each certification examinations include relevant ISO/IEC international guidance documents, including the ISO 9000 Quality Management series, with primarily focus on CDM subjects.

A recertification program was initiated in January 2003. This was initiated as a needed option for individuals who are already NDIA certified. With major continuing changes in the discipline, such as those identified above, it is recognized that no certification can be valid indefinitely. Recertification provides methods for those already certified to update their certification each five years. There are optional methods available. The Recertification Plan containing the policy and process is on the NDIA web site (www.ndia.org).

EXAMINATION AND CANDIDATE REQUIREMENTS

NDIA has established two CDM certification levels: CDM Manager and CDM Specialist. To qualify for the Manager certification, ten years of combined CDM experience is required; for the Specialist certification, five years is required. The examinations are extensive, and include the major areas of CDM. Examination is in four parts, each consisting of objective and essay questions. Objective questions are of three difficulty levels; easy, moderate, and difficult. Manager questions are selected from the moderate and difficult categories, while Specialist questions are from easy and moderate categories. Essay questions are appropriate for the differing experience levels of Manager and Specialist candidates. The passing score is 70 %; and the average success rate for those without specific preparation training is 52%. Examinations are typically scheduled after major conferences supported by NDIA, or upon request by an organization/company. The examination requires a full day to complete.

The CDM Apprentice Program was initiated in September 2003. The Apprentice Program is not a Certification Program; however, candidates that successfully pass the Apprentice Examination are issued a Certificate by the NDIA. To qualify for the CDM Apprentice Examination less than five years of combined CDM experience is required. The examination is considerably less difficult than the specialist or manager level certification examinations, but does include the identical areas of focus as current CDM Certification Examinations. The Examination is in four parts, each consisting of objective and essay type questions. Essay Questions are appropriate for the entry level experience of typical apprentice candidates. The passing score is 70 %. Examinations are scheduled during major conferences supported by NDIA, and are available on request from interested organizations.

CERTIFICATION PREPARATION COURSE

The Certification Section of the TID presents an intensive two-day preparation course designed to prepare individuals for the certification examination. It is available

throughout the year and continues to be offered because many candidates have indicated their company or agency provides little effective training to assist CDM staff in achieving certification. Many CDM practitioners have little experience in the broad range of activities of the discipline, thus the primary thrust of the course is to provide insight into each area. The course includes and emphasizes industry and international CDM practices, and applicable guidance standards itemized in the study guide, as well as government acquisition policies and contracting processes. The course is provided by NDIA Certified CDM Managers approved by the Technical Information Division.

The course has a **proven record of effectiveness**, with an 80+% success rate for candidates completing the course, versus 52% for others. Virtually all who complete the course have endorsed its effectiveness in providing candidates a powerful edge in the examination. There is a course fee; the current fees are provided below. Contact Ms. Brant Murray, Meeting Planner, NDIA, at 703-247-2572 or at bmurray@ndia.org for additional information. Also, you may also contact Chuck Billingsley at 256 714 7341 or cebillingsley@knology.net for information.

CERTIFICATION FEES

Two Day Prep Course and Exam	
NDIA Members	\$550
Non-Members	\$580*
Two Day Prep Course and Retake Exam	\$385
<i>Two Day Prep Course Only</i>	<i>\$275 (new fee breakout)</i>
<u>Examination Only</u>	
NDIA Members	\$275
Non-Members (US)	\$305*
Non-Members (non-US)	\$315*
Retake Exam	\$110
<u>Recertification (Exam Only)</u>	
NDIA Members	\$220
Non-Members (US)	\$250*
Non-Members (non-US)	\$260*

**Fees include a one year NDIA membership and are subject to change.*

NOTE: All application fees to be paid in US Dollars. When the examination is offered in conjunction with the preparation course, the combined package fee is **\$550.00** (NDIA Members) and **\$580.00** (Non NDIA Members) including a one-year NDIA membership. These fees apply to the Course and Examination conducted in conjunction with the (ACDM, TechAmerica, Systems Engineering) Conferences listed in the schedule. For Course fees at other locations, contact Chuck Billingsley for information. Application Form is provided at the end of this document.

EXAMINATION SCHEDULE

The location and schedule for Certification Examinations may be viewed at
<http://www.ndia.org/Divisions/Divisions/TechnicalInformation/Pages/default.aspx>

DATE	LOCATION
March 24, 2012	ACDM Conference, Hilton Sandestin Beach, Destin, Florida Includes 2 day NDIA Prep Course March 22, 23
April 19, 2012	Open Examination, Location TBD*, Orlando FL Includes 2 day Prep Course April 17, 18 *Contact cebillingsley@knology.net or 256 714 7341 for Location Details.
July 13, 2012	Open Examination, Location TBD, Houston, TX Includes 2 day Prep Course July 11, 12
July TBD, 2012	Open Examination, Location TBD, Atlanta, GA Includes 2 day Prep Course TBD July
September 16, 2012	TechAmerica Conference, Indianapolis, IN Includes 2 day Prep Course 14, 15 September
October TBD, 2012	Open Examination, Location TBD, Huntsville, AL Includes 2 day Prep Course TBD October
October 28, 2012	NDIA Systems Engineering Conference, Hyatt Regency, San Diego, CA Includes 2 day Prep Course 26, 27 October
October TBD, 2012	Location TBD, United Kingdom, TBD October

NOTE: The schedule included here is not updated with the specific dates when they become know. See the official schedule at the NDIA TID Webpage at:
<http://www.ndia.org/Divisions/Divisions/TechnicalInformation/Pages/default.aspx>
or through the e-mail address provided above.

BENEFITS OF NDIA CERTIFICATION

The Technical Information Division certification program is now in its twenty-first year, and the many benefits of certification are being realized by those achieving the award. First, they are recognized among their peers as experienced, exceptionally well-qualified **CDM professionals** who have proven themselves by meeting the high standards established by NDIA. Second, their certification is sponsored and authorized by the world's most prominent government-industry association. While there are other certification programs, none requires the combined experience and knowledge standards established by TID. ***There is no equivalent certification!***

Additionally, the broad recognition of NDIA certification throughout government and industry, and internationally, has resulted in many benefits for certified individuals and the companies or agencies where they are employed. For example:

- o There are RFPs requesting that developers use NDIA certified professionals to perform CDM. This has motivated more companies to support staff

certification, and to hire certified staff.

- When you are NDIA certified, you can easily apply your status and knowledge to help your organization become ISO certified.
- Many companies emphasize in RFP responses that NDIA certified CDM staff professionals will be working on their contracts.
- Some job descriptions now require NDIA certification to be considered prior to promotion to higher-level CDM positions.
- Increasingly, companies and government agencies **sponsor** employee candidates by paying certification fees and associated travel expenses. This is an important method of demonstrating support for CDM staff and the certification program.

The NDIA *National Defense* magazine publishes an article each year summarizing current information about the professional certification program. Names of each successful certification candidate and their company or agency affiliation is included, with special recognition for achieving the highest score on either the manager or specialist level examination. And some certified CDM professionals are securing jobs, or advancing to a better job, as a result of being NDIA certified.

BENEFITS OF THE NDIA APPRENTICE PROGRAM

Many individuals have recommended the NDIA Technical Information Division initiate a recognition program for the growing number of individuals who have recently entered the CDM discipline and don't meet the minimum 5 years experience for certification. This Apprentice program was the response to this recommendation and provides a track for those who intend to remain in the CDM field, and is a formal process for working toward future Certification. It also allows the individual to achieve designation as a CDM Apprentice, and be recognized by peers and management alike for their serious intent to progress in the discipline while they work toward Certification after having the required 5 years of experience. It is expected that those achieving designation as a CDM Apprentice will receive some of the same benefits as NDIA Certified individuals.

TECHNICAL INFORMATION DIVISION PROFESSIONAL CERTIFICATION SECTION

The Technical Information Division (TID) Professional Certification Section manages certification activities. The section chair reports to the TID Executive Board Chairperson. Responsibilities include developing and maintaining a dynamic certification program-recognizing individual who attains the NDIA established professional achievement levels in CDM. The section champions and promotes program expansion, prepares the study guide and examinations, coordinates schedules, conducts examinations at locations determined by demand, scores examinations, requests certification awards be mailed, and maintains certification records. The certification preparation course is developed by Professional Certification Section members (and other individual contributors) and Professional Certification Section members instruct the course, then administer the Examination

on behalf of the NDIA. Professional Certification Section membership is approved by the Technical Information Division Executive Board.

YOU MUST ACT TO BECOME NDIA CERTIFIED The purpose of this program summary is to provide information for those interested in certification; but just knowing about the program does nothing to benefit you! If you are active in government or commercial CDM, and have or soon will have, the experience levels stated above, **now** is the time to prepare for your career advancement by attaining CDM professional status. Remember, **only you are responsible, and most interested and qualified to manage your career!** You can achieve certification through NDIA, and realize the recognition and benefits of being a **certified professional**. In today's business environment, you need every edge you can achieve. NDIA certification identifies and formally recognizes you as an experienced and skilled CDM professional. The question to ask yourself is: **in today's global environment, can I afford not to be NDIA certified as a CDM professional?**

If you have questions, contact Chuck Billingsley at 256 714 7341 or cebillingsley@knology.net. You may also contact Brian Roeder at 585-242-3224 or broeder@harris.com. Another source for information is Ken Vannoy at 281-413-1029 or kvannoy@krcvconsultants.net.

CERTIFICATION STUDY GUIDE

The Configuration and Data Management Examination

Separate CDM examinations are offered for manager and specialist candidates, the difference being degree of difficulty. Examination questions are primarily based on "best practice" processes used in commercial, government and international applications, and reflect the guidance provided in listed references. Questions are appropriate for the required manager and specialist experience levels, and often may be successfully answered by candidates using their knowledge and years of experience. The examination has four parts, **each consisting of 40 objective type questions; and four (4) essay questions, three (3) of which must be answered.** Objective questions are valued at 40%, and essay questions are valued at 60% of total score. The examination requires one day to complete, normally scheduled between 8:00 am and 4:30 pm., with appropriate lunch and breaks between parts, the Examination is closed book.

The Apprentice Examination questions are primarily based on "best practice" CDM processes used in commercial, government and international applications, and reflect the guidance provided in references listed herein. Questions are appropriate for the CDM Apprentice experience level. The examinations have four parts, **each consisting of 60 objective type questions; and one (1) essay question, the apprentice examination is administered in conjunction with the Certification Examination described above.**

Following is a breakdown of the examination by subject areas.

Part 1: CDM Functions & Principles; Identification; Engineering Drawings; Specifications; Technical Data Requirements and Acquisition

- CM and DM Planning and Management
- Specifications

- Configuration Identification
- Organizing Product Information; Product Structure; Baselines
- Managing Suppliers and Subcontractors: Requirements and Methods
- Identifying Products and Product Configuration Information
- Engineering Drawings: Types; Revisions; Associated Lists; Engineering Drawing Practices
- DFARS - Legal Aspects of Technical Data

Part 2: Change Management; COTS/NDI Issues; Data Preparation and Accuracy

- CM and DM Planning and Management
- Configuration Change Management: Request for Change; Types of Change; Classification; Evaluation; CCBs; Request for Variance
- Managing Subcontractor Changes
- Part Changes: Identification; Re-identification; Marking; Numbering; Validation
- Managing Document Changes,
- Problem Change Reports; Life Cycle Data
- Drawing Revisions; Performance Measurement: (Metrics)
- Technical Data Planning; Data Item Descriptions (DIDs); Data Acquisition Documents

Part 3: Configuration Status Accounting: CSA Systems; CSA Data; Reports; Interface Control; Software Libraries; RFPs

- CM and DM Planning and Management
- Configuration Status Accounting Process: CSA Systems; CSA Data
- Technical Data Packages: Types; Purposes;
- CDM Responses to Requests for Proposal
- Performance Measurement (Metrics)
- The CDM Infrastructure Process
- Managing Interfaces: Management Tools; Use of ICWGs
- Managing Software Libraries
- Product Retrofits

Part 4: Verification and Audit; Subcontractor and Supplier Management; Metrics: International CDM: ISO Standards; Technical Data Inspection

- CM and DM Planning and Management
- Verification: Hardware, Software; Methods and Processes
- Reviews and Audits: Types
- Developer/Customer/Supplier Audit Responsibilities; Audit Locations
- Managing Suppliers and Subcontractors: Requirements and Methods
- International CDM: ISO Standards: Managing COTS and NDI Issues
- Data Accuracy - Inspection and Acceptance of Technical Data

Certification Preparation and Examination Guidance

PREPARING FOR THE EXAMINATION

- **Keep in mind the following when preparing for the certification examination:**
 - (1) The average score for all applicants is 71%, with a scoring range from 40% to 91%.
 - (2) Ninety percent of those who pass the examination score between 70% and 78%; Ninety percent of those **not** passing the examination score between 55% and 68%.
 - (3) Reference sources for questions are as follows:
 - Industry Standards 45%
 - International Standards 45%
 - MIL and DOD Standards 10%

- **The following study methods are recommended:**
 - (1) Study the reference materials, and **use them in preparing for the examination..** Be sure to get the benefit of those with experience and knowledge in *areas where you are least experienced!*
 - (2) **This is not an examination of your current job**; it covers the entire CDM discipline

TAKING THE EXAMINATION

Answering Objective Questions

- Read every word of each Multiple-Choice, True-False or Mix-and-Match question, and the answers. Do not skim over questions and quickly select the answer you think is correct. Evaluate each answer before making your selection; for multiple-choice questions, eliminate 'far out' answers to increase your success rate percentage.

- Answer every objective question! An incorrect answer is no more incorrect than a blank answer!

Responding to Essay Questions

NOTE: No specific answers are provided for sample essay questions in this study guide; however, the following is provided as guidance for preparing essay responses.

- Read the question thoroughly to assure you understand the necessary responses. All essay questions are in the following format:
 1. **An introductory paragraph identifying the subject area of the question (Do not respond to this paragraph).**
 2. **The basic question (Do not respond to this as it is so broad your answer could be too extensive for the examination time allowed).**
 3. **The question focus areas (these are the specific areas you need to address**

in your response) are numbered; you need to number your response accordingly. Each focus area will have an assigned point value.

- When responding to focus areas, it is your responsibility to convince the scoring team of your focus area knowledge. Basically, you are writing to a group of NDIA Certified CDM professionals who understand the business. They assign points based on their perception of your knowledge, as you have written it. Give thorough and complete responses that go beyond simple one-line answers.
- Essay questions are scored in a subjective manner; there are no canned answers. However, scoring teams are provided reference citations for guidance. Scoring is performed independently by at least three members of the team; then the team lead assigns final score.

PASSING THE EXAMINATION

There are two methods of passing the examination: (1) Achieve an overall total score of 70%, which requires attaining 280 of the maximum 400 points; (2) When an overall score of 70% is not achieved, each of the four examination parts are scored individually, and when 70% is achieved on any part, that part is passed. Parts not passed may be attempted again at any examination location (by application); however, all parts must be successfully completed within a 24 month period. After 24 months the examination process starts anew.

EXAMINATION SCORING

All examinations are scored by Technical Information Division scoring teams consisting of NDIA certified individuals. Each examination is scored by at least three team members and reviewed by the team lead. It typically takes three weeks to receive scores. Examination candidates are notified initially by e mail, and subsequently by a formal scoring letter. The letter may be included with the email notification of the score The examination booklets are not returned to candidates.

SAMPLE EXAMINATION QUESTIONS

EXAMINATION PART 1

Multiple Choice:

A **Vendor Item Control** drawing:

- A. Provides a description and acceptance criteria for commercial or vendor-developed items procurable from a specialized segment of industry.
- B. Was formerly called a specification control drawing.
- C. Is no longer used on commercial drawings
- D. A only
- E. A and B

Ans: E (Ref. ASME Y14.24, Par. 8.2)

True-False:

A software configuration identification scheme should cover elements of the software engineering environment.

Ans. T (Ref. ISO 12207.2, Par. 6.2.2.1 Guidance)

Essay:

To maintain effective configuration identification, there may be no more important activity than assignment of product identifiers. All products are assigned unique identifiers so one product may be distinguished from other products; one configuration of a product may be distinguished from another; the source of a product may be determined; and the correct product information may be retrieved.

Discuss product identifiers, levels of product identifiers, individual unit vs. group identifiers, and document identifiers.

Focus on the following in your response:

1. Identify/State **specific reasons** for assigning product and document identifiers. **(3 Points)**
2. Describe the **basic uses** of product and document identifiers. **(4 Points)**
3. State specifically the **developer interest** in identifiers. **(3 Points)**
4. State specifically the **customer interest** in identifiers. **(3 Points)**
5. Explain the Identifier **relationship between a part and its design document**. **(2 Points)**
6. Describe methodology for **identifying individual units of a product, versus identifying groups of units** of a product. **(2 Points)**
7. Describe/Identify the guideline for assigning a new unique product identifier to an existing product. **(3 Points)**

NOTE: It is recommended that you provide a significant response to each focus area. Provide sufficient information to allow the scoring team to evaluate your level of knowledge.

References: EIA 649A; IEEE 828/1046; ISO 10007; ISO TR 15846; MIL STD 973

EXAMINATION PART 2

Multiple Choice:

The process for controlling changes should be documented, and include:

- A. A description of, justification for, and record of the change
- B. Details of how the change should be disposition
- C. Details of how the change should be implemented and verified
- D. A, B and C
- E. None of the above

Ans: D (Ref. ISO 10007 Par. 5 .4)

True/False:

Software configuration management may be performed by combinations of software, methods, tools and techniques; and SCM requirements will vary considerably depending on which tools are used to implement SCM.

Ans: F (Ref: ISO TR 15846 Intro. Page. iii)

Essay:

Describe the primary functions necessary when processing proposed changes, including:

Evaluation, Impact Assessment; Effectivity; Cost; Approval/Disapproval; Implementation; and Verification.

Summarize significant elements of the change management process.

Focus on the following in your response.

1. Describe/define change management **(4 Points)**
2. Itemize the functions/elements of change management **(6 Points)**
3. For each change management function, describe the content and purpose of each **(10 Points)**

NOTE: Base the response on your experience and knowledge. The scoring team will evaluate your answer based on the accuracy and depth of information you provide in focus areas.

References: (EIA 649A; EIA 649 Handbook; ISO 10007; ISO 12207.0; IEEE 828; ISO TR 15846)

EXAMINATION PART 3

Multiple Choice:

Inspection of TDP elements includes which of the following:

- A. A customer assigned identification
- B. Legibility and reproducibility.
- C. Accuracy of subcontractor references
- D. A, B and C
- E. None of the above.

Ans: B (Ref: MIL std 31000)

True/False:

When data are provided on physical media such as disks or tapes, appropriate identification is affixed to the media to identify its contents. When it is impractical to include the entire file identification an additional media item with the needed complete data should be provided.

Ans: F (Ref: EIA 649A Par. 5.1.8)

Essay:

On acquisition contracts there are various methods to determine the need for technical information, the type information and its delivery schedule. The information can range from design, performance and manufacturing information, to installation, operation and maintenance data.

Summarize the types of product information that may be included in a product acquisition contract (use either a commercial or DOD acquisition scenario).

Focus your response on the following:

1. Describe methods that may be used to determine the data provided **(8 Points)**
2. Major risk factors involved for the developer and customer. **(6 Points)**
3. Describe various types of technical information that developers typically prepare, their use and value to the users. **(6 Points)**

NOTE: Base the response on your experience, training and knowledge. References: (ISO 9000; ISO 9001; EIA 649A; ISO 12207.0/1; DOD 5010.12M; EIA 859)

EXAMINATION PART 4

Multiple Choice:

The **configuration verification and audit** process:

- A. Ensures product quality and that a state of the art design has been achieved
- B. Establishes that the performance and functional requirements defined in configuration documentation have been met
- C. B and E
- D. Identifies potential cost overruns
- E. Validates the processes used to provide adequate control and visibility

Ans. C (Ref. EIA 649A Par. 5.5)

True False:

Release and delivery of software products and documentation is a formally controlled configuration management activity.

Ans: T (ISO 12207.0 Par. 6.2.6)

Essay :

As in many other areas of CDM, the requirements and basics of the discipline are similar as they are applied to both hardware and software products. However, there are aspects of software that often require configuration management to use some different tools and processes, and to fully consider the varying attributes of software. Specifically, the software verification and validation process must determine if the software product fulfills its requirements.

Discuss software verification and validation processes in terms of the below subjects.

Focus your response on the following:

- 1. Define software verification and software verification process. **(2 points)**
- 2. Define software validation and software validation process. **(2 points)**
- 3. List the specific tasks of software verification **(4 points)**
- 4. Describe/Itemize/List the activities for each software verification task. **(8 points)**
- 5. Describe/Itemize/List the activities of each software validation task. **(4 points)**

NOTE: No specific reference need be used in responding to this question. Include sufficient information in your response to convince the scoring team of your knowledge.

References: ISO 12207.0 Par. 3; 6

PROGRAM SUCCESS

When evaluating any certification program, the number of individuals who have been certified is an important consideration, and the number certified is one valid measure of its success. NDIA CDM certification is the clear industry leader, by far. Through December 2011, over 2400 configuration and data management professionals have been certified.

EXAMINATION REFERENCES

Weight numbers 1 or 2 have been assigned to references; 1 requires the most study, and 2 the least. Essay questions are based on subject matter addressed in references weighted 1. The issue of each reference document is the date at the end of December 2011.

Weight	Document No.	Title
Industry Standards		
1	EIA 649B	National Consensus Standard- Configuration Management
1	EIA HDBK 649	Implementation Guide for Configuration Management
2	EIA 836B	CM Data Exchange and Interoperability
<u>2</u>	EIA 859	Data Management
1	ANSI/IEEE 828	Software Configuration Management Plans
1	ANSI/IEEE 1042	Software Configuration Management [Cancelled] Still being used, thus still in the reference list
1	ASME Y14.24	Types and Applications of Engineering Drawings
1	ASME Y14.34	Associated Lists
1	ASME Y14.35	Revision of Engineering Drawings and Associated Lists
1	ASME Y14.100	Engineering Drawing Practices
International Standards		
1	IEEE 12207.0	Software Life Cycle Processes – Second edition
1	IEEE 12207.1	Software Life Cycle Processes - Life Cycle Data
2	IEEE 12207.2	Software Life Cycle Processes - Implementation
1	ISO Tech Report 15846	Technical Report Information Technology - Software Life Cycle Processes - Configuration

Management

1	ISO 9000	Quality Management Systems- Fundamentals/Vocabulary
1	ISO 9001	Quality Management Systems - Requirements
2	ISO 9004	Quality Management Systems - Guidelines for Performance Improvement
2	ISO 10007	Quality Management - Guidelines for CM

Government Standards and Specifications

1	DoD 5010.12-M	Procedure For The Acquisition & Management of Technical Data
1	MIL STD 961E	Defense and Program Unique Specifications Format and Content
1	MIL STD 963B	Preparation of Data Item Descriptions
2	MIL STD 973 (Notice 5)	Configuration Management [Cancelled] continues to be used, thus still in the reference list
2	MIL STD 1840C	Automated Interchange of Technical Information
2	MIL-STD-31000	Standard Practice - Technical Data Packages
1	MIL HDBK 61A	DOD Configuration Management Guidance
2	NASA STD 0005	NASA Configuration Management (CM) Standard



CDM PROGRAM ▶ REGISTRATION FORM

NATIONAL DEFENSE INDUSTRIAL ASSOCIATION ▶ 2111 WILSON BOULEVARD, SUITE 400 ▶ ARLINGTON, VA 22201-3061
(703) 522-1820 ▶ (703) 522-1885 FAX ▶ WWW.NDIA.ORG

FOR NDIA USE:

EVENT _____ **LOCATION** _____ **DATE** _____

Years Specific CDM Experience _____ ▶ Address Change Needed

NDIA Master ID/Membership # _____ Social Security # _____
(If known - hint: on mailing label above your name) (Last 4 digits - optional)

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PREFERRED WAY TO RECEIVE INFORMATION

Conference Information Address above Alternate (Print address below) E-mail
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Alternate Street Address _____

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*By your signature above, you consent to receive communications sent by or on behalf of NDIA, its Chapters, Divisions and affiliates (NTSA, AFEI, PSA, WID) through regular mail, e-mail, telephone or fax. NDIA, its Chapters, Divisions and affiliates do not sell data to vendors or other companies.

I AM REGISTERING AS A (please check one):

Certified Configuration and Data Manager (CCDM)
(Requires Ten Years CDM Experience)

Certified Configuration and Data Specialist (CCDS)
(Requires Five Years CDM Experience)

Configuration and Data Manager Apprenticeship (CDMA)

REGISTRATION FEE (please check one):

- NDIA Member Prep Course and Exam \$550
- Non-Member Prep Course and Exam¹ \$580
- Prep Course and Re-take Exam \$385
- Prep Course Only \$275
- NDIA Member Exam \$275
- Non-Member Exam (U.S.)¹ \$305
- Non-Member Exam (Non-U.S.)¹ \$315
- All Retake Exams \$110
- NDIA Member Recertification Only \$220
- Non-Member Recertification Only (U.S.)¹ \$250
- Non-Member Recertification Only (Non-U.S.)¹ \$260

¹ Registration fees for non-NDIA (or affiliate) members include a one-year non-refundable NDIA membership — \$15.00 will be applied for your 12 month subscription to National Defense magazine. No, do not sign me up for the membership.

PAYMENT OPTIONS:

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VISA MasterCard American Express Diners Club Cash

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**E-MAIL COMPLETED REGISTRATION FORM WITH CURRENT RESUME APPLICATION TO:
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BY COMPLETING THE FOLLOWING, YOU HELP US UNDERSTAND WHO IS ATTENDING OUR EVENTS.

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- R&D/Laboratories
- Army
- Navy
- Air Force
- Marine Corps
- Coast Guard
- DOD/MOD Civilian
- Government Civilian (Non-DOD/MOD)
- Trade/Professional Assn.
- Educator/Academia
- Professional Services
- Non-Defense Business
- Other _____

CURRENT JOB/TITLE/POSITION.

- Check ONE.
- Senior Executive
 - Executive
 - Manager
 - Engineer/Scientist
 - Professor/Instructor/Librarian
 - Ambassador/Attaché
 - Legislator/Legislative Aide
 - General/Admiral
 - Colonel/Navy Captain
 - Lieutenant Colonel/Commander/ Major/Lieutenant Commander
 - Captain/Lieutenant/Ensign
 - Enlisted Military
 - Other _____

Year of birth _____
(optional)

QUESTIONS, CONTACT:

MS. BRANT MURRAY
MEETING PLANNER
PHONE: (703) 247-2572

E-MAIL REGISTRATION TO:

BMURRAY@NDIA.ORG

MAIL REGISTRATION TO:

NDIA - CDM PROGRAM
2111 WILSON BOULEVARD
SUITE 400
ARLINGTON, VA 22201