

CAPD
CERTIFIED DEMAND PLANNER

CERTIFIED ANALYST IN DEMAND PLANNING

CERTIFICATION ROAD MAP





INTRO & FAQ

Demand Planning Net has launched the professional certification program in Demand Planning called CADP—Certified Demand Planner. This Certification program prepares professionals with the background and educational qualifications through training workshops and an evaluation process to take on professional demand planning positions with global corporations in various industries.

CADP provides a level of recognition to the professional and assurance to the hiring organization on skill sets and capabilities to perform the job of a demand planner. It is useful to both individuals and corporations seeking to advance their demand planning credentials.

The purpose of this document is to define the CADP program requirements as well as provide an outline of the body of knowledge to certification candidates.

WHAT IS DEMAND PLANNING?

Demand planning is the art and science of planning customer demand to drive holistic execution of demand by corporate supply chain and business management. Demand planning starts with a solid statistical forecast and adds intelligence through consensus management of the demand information process.

WHY IS DEMAND PLANNING IMPORTANT?

Companies that are superior performers in Demand Planning and Supply Chain Forecasting have shown to be market leaders in their industry with increasing revenues and profits, better service delivery levels and inventory turns.

WHAT IS THE VALUE OF CERTIFICATION?

Client companies in our portfolio have sought the next level of assessment to provide certification to the planners so they can identify the qualified individuals for high profile planning positions. HR departments have quickly recognized Demand Planning as a key profession in the world and increasingly seek individuals with proven Demand Planning credentials, such as a qualified certification.

BODY OF KNOWLEDGE

DEMAND PLANNING OVERVIEW

- Why Forecast and Plan?
- The Service – Cost – Balance Model
- Introduction to Demand Planning
 - What, Why and How?
- Beyond Statistical Forecasting
- Key Components of a Demand Plan
- Key Terminology
 - Forecast Horizon, Buckets & Periodicity
- Constrained vs. Unconstrained Forecasts
- Demand Management

DATA CLEANING & ADJUSTMENTS FOR DEMAND FORECASTING

- What Do We Know About Data?
- The Forecast Problem and Data Collection
- What is Demand – Shipments vs. Orders
- Gross Demand vs. Net Demand
- Data Cleaning Challenges
- Adjusting for Historical Shifts in Demand
- Data Filtering
- Outliers
- Process to Identify Outliers
- What is a Tolerance Band?
- Methodology for Outlier Correction

DEMAND CONSENSUS

- Demand Consensus
- Reporting
- The Monthly Cycle

STATISTICAL MODELING

- Forecast Model
- Demand Components & Graphical Decomposition
- Predictable and Unpredictable Volatility
- Illustration of Demand Components
- Key Components of Demand
- Understanding the Components
- Trend
- Seasonality
- Cyclicalities
- Graphical Decomposition
- Additive vs. Multiplicative Seasonality in Models
- Modeling by decomposition
- Introduction to Forecast Modeling
- Qualities of a good Statistical Forecast
- Balancing between Model Fit vs. Model Robustness
- Uni-Variate Time Series vs. Multi-Variate Methods
- Moving Average
- First Order Exponential Smoothing or Constant Models
- Holt Models to accommodate Trend
- Holt Winters Models
- Exponential Trend and Dampening
- Event Modeling

PRODUCT LIFE CYCLE & LONG-TERM PLANNING

- Cyclicalities
- Product lifecycle and trend
- Launch Forecasting
- Volume effect on line extension

DATA ANALYSIS & SKU SEGMENTATION

- Simple Model of Demand
- Demand Volatility
- What is the Approach to Data Analysis?
- Impact of Data Volatility on Forecasting
- Measuring Volatility
- Impact of Multiple Extreme Observations on Volatility
- SKU Segmentation for Forecast Modeling
- Volume Volatility a 2x2 Grid
- Modeling by Exception

FORECAST ERRORS AND MODEL DIAGNOSTIC

- Definition of Demand Forecast Errors
- Forecast Accuracy
- Forecast Bias vs. Forecast Error
- Error and Volatility Reduction
- Errors Across SKUS vs. Errors Across Time
- Model Diagnostics – Measuring Error over time
- MAD
- MAPE vs. MPE
- WAPE
- Root Mean Squared Error
- General Illustration MPE, MAPE and RMSE

PLANNING FOR INTERMITTENT DEMAND

- What is intermittent demand?
- Illustration of Intermittent Demand Data
- What causes intermittency?
- Strategies to handle intermittent demand
- Business Perspective
- Stat Models
- Statistical Models for Intermittent Demand
- Application of Croston's model
- Discrete Distribution

MEASURING FORECAST PERFORMANCE

- Forecast Errors and Action-ability
- Sources of Forecast Error
- Definition of Demand Planning Metrics – WAPE & Bias
- Types of Bias
- SKU Mix Error
- Error Analysis for Continuous Improvement

DEMAND CONSENSUS PROCESS

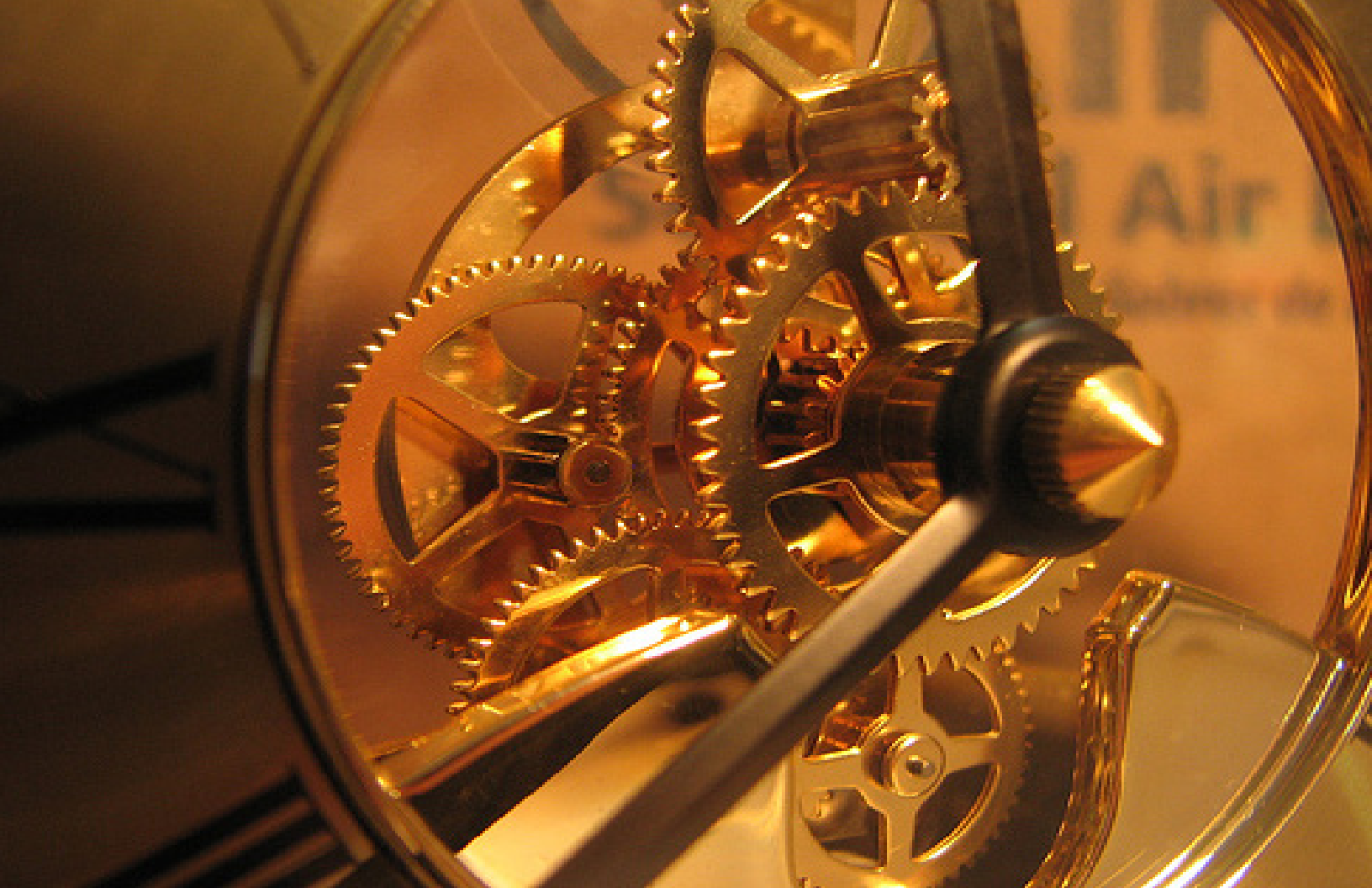
- Organization Structure and Culture
- Role of the Demand Forecaster
- Demand Communication
- Demand Collaboration
- How do you define the Forecasting Level?
- What to include in the forecast
- Supporting plan for incremental demand
- Forecast Reconciliation
- Dollarizing the Forecast
- Price vs. Mix
- Agree to Disagree
- Business Unit Lead Presentation and Buy-in
- Exception Management & Reporting
- Waterfall Charts
- Forecast Delta Process
- Demand Consensus Meetings

MODULES

CERTIFICATION TRAINING MODULES

THE CANDIDATES WILL BE TRAINED and evaluated on the body of knowledge contained in thirteen training modules. Four of the Modules will be assigned for self-study aided by on-line videos and training materials. The other modules will be offered as instructor-led training lectures.

DAY	MODULE	TOPIC	LEARNING FORMAT	ADDITIONAL DETAILS
PRE-REQUISITE	Questionnaire	Email w/registration questionnaire	Online	
PRE-REQUISITE	Module One	Demand Planning Overview	Online	IN-SEMINAR FEES
PRE-REQUISITE	Module Two	Product Life Cycle Planning includes Product Launch, Pipeline fill and discontinuation	Online	
PRE-REQUISITE	Module Three	Demand Consensus Process include Reporting and the Monthly cycle	Online	INCLUDED IN WORKSHIP PRICE
PRE-REQUISITE	Module Four	Planning for Intermittent Demand	Online	IN-SEMINAR FEES
DAY ONE	Module Five	Demand Planning Q&A overview	In-person Q&A on overview	ONLINE OVERVIEW
DAY ONE	Module Six	Data cleaning and adjustments	In-person 2-day	
DAY ONE	Module Seven	Statistical Modeling Part 1	In-person 2-day	DECOMPOSITION
DAY TWO	Module Eight	Product Portfolio Optimization	In-person 2-day	
DAY TWO	Module Nine	Forecast Errors and Model Diagnostic	In-person 2-day	
DAY TWO	Module Ten	Statistical Modeling Part 2 - Events	In-person 2-day	
DAY TWO	Module Eleven	Measuring Forecast Performance	In-person 2-day	
POST-EVENT	Module Twelve	Linear Decomposition (optional)	Online	



ELIGIBILITY

ELIGIBILITY FOR CADP CERTIFICATION PROGRAM

EXAM REGISTRATION & REQUIREMENTS

CANDIDATES MUST COMPLETE THREE ELIGIBILITY REQUIREMENTS TO SIT FOR THE CADP EXAM:

1. Academic and experience requirement
2. Ethics statement of academic and professional integrity
3. Training requirement

I. ACADEMIC AND EXPERIENCE REQUIREMENT

Certification candidates shall have a combined six years minimum of relevant post-secondary education and professional work experience in a demand or supply chain role (finance, marketing, forecasting, sales, inventory management, operations or supply chain management, purchasing, etc.). This includes at least an associate's degree from an accredited institution, and at least two years of work experience.

THE FOLLOWING FOUR TYPES OF COMBINATIONS ARE ACCEPTABLE

- I.** A bachelor or equivalent college degree in business or related fields such as economics, engineering, math or statistics **PLUS** two years of professional experience as defined above.
- II.** An associate or equivalent college degree in business or related fields **PLUS** four years of professional experience as defined above.
- III.** A bachelor or equivalent college degree in any field **PLUS** four years of professional experience as defined above.
- IV.** An associate or equivalent college degree in any field **PLUS** six years of professional experience as defined above.

The following examples may serve as a helpful comparison for candidates to gauge their eligibility for CADP. Please contact Demand Planning, LLC for the formal assessment.

EXAMPLE #1

A B.S. in business management plus two years of experience as a planner. (eligible, meets combination type I above)

EXAMPLE #2

A high school graduate with six years of experience in marketing. (Ineligible, fails to meet minimum education requirement of an associate degree).

EXAMPLE #3

A B.S. in history and five years of experience as a stockroom clerk. (Ineligible, fails to meet minimum requirement of four years of professional experience as applied to combination type III above)

EXAMPLE #4

B.A. in liberal arts and four years of experience as a forecaster (eligible, meets combination type III above)

Candidates shall upon request submit any of the following, in combination as necessary, as verification of eligibility: (a) resume w/ references (b) referral letter(s) from a current and/or prior employer (c) official college transcript(s)

Candidates who have not yet met the eligibility requirements may still sign up for the training workshop, although they will not be allowed to sit for the certification exam.

2. ETHICS STATEMENT OF ACADEMIC AND PROFESSIONAL INTEGRITY

Certification candidates are required to sign and submit the following to complete their eligibility (Download the Ethics Statement of Academic Integrity form available on the website):

“By using the Demand Planning LLC website, knowledgebase and registering for the certification I declare that I have upheld the highest level of integrity in completing the CADP and/or CMDP requirements.

All work involved is my own, including any eligibility requirements, online or in-person training requirements, and testing.

I agree not to share any proprietary information with other candidates, including discussion of specific exam questions and/or answers, with the sole exception of discussing anecdotal experiences.”

3. TRAINING REQUIREMENT

A MINIMUM OF 20 HOURS OF BLENDED LEARNING IS REQUIRED, AS FOLLOWS:

- * Successful completion of four on-line modules
- * Successful completion (requiring active participation) of the two-day workshop on Demand Planning and Sales Forecasting

If the certificate workshop is not completed, the candidate shall not sit for the exam. The exam fee will be deferred for one year to facilitate the candidate to re-take the 2 day workshop at a discounted rate of 50% and then sit for the exam

CERTIFICATION
CANDIDATES
MAY REGISTER
FOR THE
CADP ONLINE
THE WEBSITE
WILL PROVIDE
FULL DETAILS,
INCLUDING
CURRENT
COURSE
OFFERINGS
AND PRICING.



RESOURCES

THE SCHEDULE OF
UPCOMING WORKSHOPS
IS AVAILABLE AT
DEMANDPLANNING.NET

EXAM RESOURCES

THE PRIMARY RESOURCE for candidates is the required training workshop, including but not limited to any pre-assignments, lecture, exercises, workbook, handouts, roundtable discussion and summary.

The Body of Knowledge section of this document provides an outline of the major topics with a detailed breakdown into subtopics.

Please refer to the Key Terminology section of this document for a listing of vocabulary terms, including acronyms. Note that while this listing is intended to be comprehensive, it is not exhaustive. The candidate will be responsible for any additional terms noted and defined at the required workshop or within the online modules. A listing of acronyms is found here: <http://demandplanning.net/acronyms.html>

The following link offers a free downloadable template which illustrates calculations of metrics (MAD, MAPE, etc.): <http://demandplanning.net/DemandMetricsExcelTemp.htm>

Supplemental resources include discussion, articles, links and blog posts found at: demandplanning.net/learn-planning.htm

TAKING THE EXAM

FORMAT

The exam is four hours long and administered in two parts on the same day. Each part will count towards a 50% weight.

PART 1

Concepts and Theory - 50 multiple choice questions

SAMPLE PART ONE QUESTION

Customer requests, POS information, forecasts and distribution replenishment orders are all examples of:

- (a) Supply
- (b) Demand
- (c) Short term requirements
- (d) Long term requirements

The correct response is choice (b), as these are all examples of demand. Choice (a) is incorrect because supply is the opposite of demand. Choices (c) and (d) are incorrect as these include examples of both long and short term requirements.

PART 2

Practical Problem Solving with calculations - 25 multiple choice questions involving calculations and forecasting case studies (software provided).

Candidates shall note that for both part one (concepts and theory) and part two (practical application) questions, the goal is to select the best answer from among the choices provided. Please refer to the "Testing Strategy" found later in this guide.

SAMPLE PART TWO QUESTION

What is the root mean squared error of the forecast as given in the following chart of data?

- (a) 727
- (b) 3635
- (c) 30
- (d) 27

	Actuals	Forecast	Error	Absolute Deviation	Squared Error
Jan	75	100			
Feb	72	90			
Mar	125	80			
Apr	69	75			
May	100	75			

The correct response is (d), as given in the following chart and calculated as a result of cell reference formulae in MS Excel. Choice (a) is incorrect as this is the mean squared error. Choice (b) is incorrect as this is the total squared error. Choice (c) is incorrect as this is simply a distractor.

	Actuals	Forecast	Error	Absolute Deviation	Squared Error
Jan	75	100	-25	25	625
Feb	72	90	-18	18	324
Mar	125	80	45	45	2025
Apr	69	75	-6	6	36
May	100	75	25	25	625
				Total:	3635
				Average (mean):	727
				Root Mean Sq. Error:	26.96

Candidates shall note that for both part one (concepts and theory) and part two (practical application) questions, the goal is to select the best answer from among the choices provided. Please refer to the "Testing Strategy" found later in this guide.

PASSING THE EXAM

The candidate shall secure a total of 70% of the eligible points, with a minimum of 60% in each part of the exam. Certification will be awarded upon meeting these requirements.

For example, a candidate scoring 80% on part I and 60% on part II will earn an overall score of $(60\% + 80\%)/2 = 70\%$ and pass. A candidate scoring 60% on part I and 65% on part II will not have met the overall requirement of 70%, as $(60\% + 65\%)/2 = 62.5\% < 70\%$.

Notification will be provided to candidates within 4-6 weeks after taking the exam.

RETAKING THE EXAM

If the minimum required score is not met, the candidate will obtain a discount voucher to participate in a "refresher course" which is a single day workshop consisting of exam content review in the morning and sitting for the exam in the afternoon. The discount is for 50% off of the normal price and is valid for one year from the original testing date.



MAINTENANCE

CERTIFICATION MAINTENANCE

CADPS ARE REQUIRED TO MAINTAIN THEIR CERTIFICATION STATUS VIA THE FOLLOWING CRITERIA:

1. Completion of an online certification maintenance form every five years.
2. Documentation validating 50 credits of professional development over a period of five years, earned as follows:
 - (a) **1 CREDIT** per hour of professional development activity (attending conference sessions, training events or speaking engagements related to a core topic, e.g. forecasting, inventory planning, S&OP, etc.)

For example, attending a professional dinner meeting discussing forecasting concepts will earn 1 credit. Attending a half day workshop on Sales & Operations Planning will earn 4 credits.
 - (b) **3 CREDITS** per hour of professional development delivery (presenting conference sessions, training events or speaking engagements related to a core topic, e.g. forecasting, inventory planning, S&OP, etc.)
 - (c) Professional membership in either the IIF or the ISM, or a similar renowned organization, will earn **2 CREDITS** per year of affiliation/membership.

(d) Active member in Demand Planning Net Forums and Discussion groups - **2 CREDITS** per year.

(e) Published works, relating to a core topic, that appear in a trade journal, conference proceedings and/or on an industry-recognized website will earn **3 CREDITS**. Note: self-publishing, such as an e-newsletter, personal website or blog, will not be recognized.

SUSPENSION

Failure to adhere to the requirements outlined herein will result in a suspension of the CADP designation. CADP's subjected to this forfeiture agree to stop promoting their CADP credentials (via business card, resume, curriculum vitae, etc.).

One may re-acquire the CADP status by sitting for and passing the exam only if completed within one year of certification revocation. Beyond one year the candidate must complete all original training requirements (online modules and in-person workshop) before sitting for the exam.

KEY TERMINOLOGY

Abnormal Demand	(DRP)	Multivariate
Account Based Forecasting (ABF)	Economic Forecasts	Net Demand
Actual	Economic Order Quantity (EOQ)	Noise
Additive Seasonality	Electronic Data Interchange (EDI)	Orders
Ad-hoc Pass	Engineer-to-order (ETO)	Ordinary Least Squares (OLS)
Aggregation	Enterprise Resources Planning (ERP)	Outlier
Assemble-to-order (ATO)	Event Modeling	Percent Mean Absolute Deviation (PMAD)
Auto Regressive Integrated Moving	Exception	Periodicity
Average (ARIMA)	Exponential Smoothing	Pipeline Volume
Backorders	Ex-Post Forecast	Point-of-Sale (POS)
Bias	Fast-moving Consumer Goods (FMCG)	Preliminary Pass
Bill of Material (BOM)	Final Pass	Product Launch
Bookings	Financial Forecasts	Product Lifecycle
Business Forecasting	Finished Goods (FG)	Randomness
Business Planning	Forecast	Raw Materials (RM)
Capacity	Forecast Bucket	Regression
Carry-overs	Forecast Accuracy	Replenishment
Causal Models	Forecast Cycle	Robustness
Channel Effects	Forecast Error	Root Mean Squared Error (RMSE)
Co-efficient of Variation (CV)	Forecast Inaccuracy	Safety Stock
Collaboration	Forecast Pass	Sales
Collaborative Planning,	Forecasting	Sales and Operations Planning (S&OP)
Forecasting and Replenishment (CPFR)	Gross Demand	Seasonality
Co-managed Inventory (CMI)	History	Segmentation
Configure-to-Order (CTO)	Holt's Model	Service Level
Consensus	Holt-Winter's Model	Shipments
Consensus Business Planning (CBP)	Horizon	Standard Deviation (SD)
Constrained Forecast	Independent Demand	Standard Error (SE)
Consumer Packaged Goods (CPG)	Intermittent Demand	Statistical Forecasting
Cross-product Effects	Inventory	Statistical Model
Croston's Model	Just-in-time (JIT)	Stockkeeping Unit (SKU)
Customer	Key Performance Indicator (KPI)	Strategic Forecasting
Cuts	K-factor	Supply
Cyclicalities	Less Than Truckload (LTL)	Tactical Forecasting
Dampening	Level	Time Series
Data	Maintenance, Repair and Operations (MRO)	Tolerance Band
Decomposition	Make-to-order (MTO)	Trend
De-listments	Make-to-stock (MTS)	Unbiased
Demand	Market Intelligence	Unconstrained Forecast
Demand Driven Supply Networks (DDSN)	Materials Requirements Planning (MRP)	Uni-variate
Demand Filter	Mean	Vendor-managed Inventory (VMI)
Demand Management	Mean Absolute Deviation (MAD)	Volatility
Demand Planning (DP)	Mean Absolute Percent Error (MAPE)	Weighted Absolute Percent Error (WAPE)
Dependent Demand	Mean Squared Error (MSE)	Working Capital
Direct-to-channel (DTC)	Model Fit	Work-in-process (WIP)
Distribution Center (DC)	Moving Average	
Distribution Requirements Planning	Multiplicative (trend or seasonality)	



TESTING STRATEGY

The list below provides “top ten tips for taking exams” and should prove highly valuable. Successful candidates will counter test anxiety by simultaneously remaining relaxed while focused on the task at hand. Above all else, the candidate should remain confident and think positive throughout the exam.

TOP TEN TIPS FOR TAKING EXAMS

1. There is no penalty for a wrong answer, which means you should at least guess and leave no question unanswered.
2. Your first hunch is most likely to be correct.
3. Do some simple math problems before the test. Math “wakes up” the brain, like stretching a muscle before a workout.
4. Sometimes you may find that the answer is obvious. Do not be afraid or concerned that “it can’t be that easy.” Yes, it can. Just mark it and move on.
5. Sometimes you may find that your preferred answer is not there. Do not be afraid or concerned that “it can’t be that hard.” Yes, it can. Try re-reading the question to be sure you understand what is being asked, but do not spend an excessive amount of time trying to figure it out. Just guess and move on.
6. There may be a question in the exam that refers to similar material asked in an earlier question that you were unsure of. You might find that this question provides a hint toward solving the earlier question, or vice-versa.
7. You may be presented with graphics or a short narrative describing a situation. Try to determine as much information as possible (i.e., draw conclusions) before looking at the question(s) that follow. Ask yourself “what is this telling me” and then go to the question(s). Similarly, try to think of what the answer may be before looking at the choices.
8. Select a default answer in advance of the exam (for example, choice “C”) and always use this when you must guess. Statistically, this will maximize your probability of guessing the correct answer. The exception case is if you have already eliminated C.
9. If you have four choices, your probability of guessing correctly is $\frac{1}{4} = 25\%$.
If you can eliminate one, your probability of guessing correctly is $\frac{1}{3} = 33\%$.
If you can eliminate two, your probability of guessing correctly is $\frac{1}{2} = 50\%$.
If you can eliminate three, your probability of guessing correctly is $1/1 = 100\%$.
10. If you notice an answer that could be true in a given situation, this does not necessarily mean it is the correct choice. Exam questions apply to the general case, not the exception case (unless the question clearly indicates otherwise). Similarly, exams are not based on a particular business environment. Focus on what you learned in review, not necessarily what you do at your job. If you have a broad employment background among diverse environments you are likely to fare better than someone who has done the same job at the same company for 20 years.

DO SOME SIMPLE MATH PROBLEMS BEFORE THE TEST. MATH “WAKES UP” THE BRAIN, LIKE STRETCHING A MUSCLE BEFORE A WORKOUT.

CERTIFIED MASTER IN DEMAND PLANNING (CMDP)

Successful CADP candidates will be encouraged to advance to the higher level certification: Certified Master in Demand Planning. The CMDP is realistically positioned for seasoned professionals such as Senior Planners and mid-to-upper level Managers.

The CMDP is expected to be released in 2015. Please monitor the web for the latest information updates.

ADDITIONAL INFORMATION

Demand Planning, LLC reserves the right to update the information contained within this document without prior notice. This includes, but is not limited to, certification eligibility requirements, training requirements and certification maintenance.

For more information regarding the certification programs, course schedules, consulting or training opportunities, or any related item please visit our website at www.DemandPlanning.net.

The homepage provides links to the DP social media sites such as Twitter, LinkedIn, Facebook, and the DP forecasting blog as well as an opportunity to subscribe to the DP newsletter.

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VALTITUDE / DEMAND PLANNING LLC

Demand Planning, LLC is a Massachusetts consultancy that specializes in business process and strategy consulting.

We have helped a variety of businesses across industries to streamline their value chains and improve efficiency through demand analysis and diagnostics, process re-design, solutions implementations, and customized training.

WE CAN HELP YOU...

Analyze your existing process to discover areas of opportunity.

Design, set up, and implement a planning process that reduces inventories, improves customer service, and grows revenue

Use collaboration and demand information to create better supply chain forecasts

Create a holistic planning forum where Sales, Marketing and Operations work off the same plan

Manage the entire planning process through exceptions