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FOUNDATION



The Institute of Cost Accountants of India

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Message for the President



Message from the PRESIDENT

Dear Students,

Greetings,

“Take up one idea. Make that one idea your life; dream of it; think of it; live on that idea. Let the brain, the body, muscles, nerves, every part of your body be full of that idea, and just leave every other idea alone. This is the way to success, and this is the way great spiritual giants are produced.” – Swami Vivekananda.

The Institute prepares the course curriculum considering the perspective of the ongoing best practices which are in vogue both in domestic and global arena. Professional expertise of both the academia and industry doyens is well blended in the syllabi. To achieve six important skill sets- Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation based on four knowledge pillars as Management, Strategy, Regulatory Function and Financial Reporting, the CMA course entails skills for employability worldwide. Communication and soft skill sessions coupled with rigorous computer training help the students to enhance knowledge and to face the challenges.

The June term of examination is over. You have silently studied for weeks, and now you need to wait for your results to get published. Those who have worked hard, and studied meticulously, your success will be loud and proud. You are strong, you are well prepared and you will succeed. All the hard work is about to pay off in success and cheers. I firmly believe that you can achieve your target.

As you are aware that study materials are continuously updated for incorporation of necessary amendments paper wise where those are extremely needed and also the same is carried out in all the papers with the view of providing you the needed and relevant information. Answers to Mock Test Papers (MTPs) and Model Question Papers (MQPs) have been uploaded. Please refer to those publications, published and/ or uploaded by the Directorate of Studies (D.O.S.) for your steady professional development.

“Education is the key to unlocking the golden door of freedom” I strongly believe that our students will conquer the World in their own way,

Good luck to you all,

CMA Ashwin G. Dalwadi
President,
The Institute of Cost Accountants of India

Message for the Chairman

Message from the CHAIRMAN



Dear Students,

Greetings!!!

It gives me immense pleasure to address you as the Chairman of the Training & Education Facilities Committee of the Institute.

A student's world is a beautiful yet mysterious embroidery made up of a multitude of hopes and aspirations dyed in bright colours of thought and deed and their world is very much influenced by the environment of the institutions they are attached with.

The Institute of Cost Accountants of India and more specifically the Directorate of Studies, strive hard to provide resources that enhance your journey from student to a professional. The implicit promise of The Institute has always been a transformative education, rooted in the highest standards of academic excellence, nurtured by ethics and values and enriched by the opportunity to learn in the best settings.

I want to congratulate to all the aspirants of June, 2023 term of examinations and also to the prospective students of the forthcoming December 2023 term of examinations, well in advance! Moreover, you must have noticed and delighted to know that we are back to the original date of examinations from the December, 2023 term of examinations. I request to all of you to regularly look into the Students portal of the Institute to keep yourselves up to date.

I extend my heartfelt gratitude to the academicians engaged in the process and every effort of them, are highly appreciated, who has contributed towards making learning through Students E-bulletin so meaningful.

As we embark on this exciting journey, I want you to know that our new council and Training & Educational Facilities Committee is here to listen, support, and work alongside each and every one of you. We welcome your thoughts, suggestions, and feedback with open arms

Let us make this academic year one to remember—a year of growth, inspiration, and unity. Together, we will leave an indelible mark on our institute and profession and create a legacy that future generations of students can proudly carry forward

May you all continue to scale greater and insurmountable heights of excellence,

Best wishes,

CMA Vinayranjan P.
Chairman, Training & Education Facilities Committee
The Institute of Cost Accountants of India

Knowledge Update

KNOWLEDGE Update



In this section of e-bulletin we shall have a series of discussion on each of these chapters to provide a meaningful assistance to the students in preparing themselves for the examination at the short end and equip them with sufficient knowledge to deal with real life complications at the long end.

Fundamentals of Economics & Management (FEM)

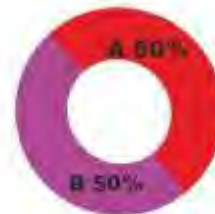


PAPER: 1, PART: I

FUNDAMENTALS OF ECONOMICS & MANAGEMENT - (FEM) - ECONOMICS

Dr. Bibekananda Raychaudhuri
Associate Professor,
Department of Economics,
N.S.O.U., Kalyani, W.B.
He can be reached at:
brchaudhuri@gmail.com

Your Preparation Quick



Syllabus Structure

A Fundamentals of Economics 50%
B Fundamentals of Management 50%

Learning Objectives:

- Studying economics, one will be able to develop the analytical skills needed to work successfully in the field, including the study of logical analysis.
- Students will be able to identify and explain economic concepts and theories related to the behavior of economic agents, markets, industry and firm structures, legal institutions, social norms, and government policies.
- Students will be able to integrate theoretical knowledge with quantitative and qualitative evidence in order to explain past economic events and to formulate predictions on future ones.
- Students will be able to evaluate the consequences of economic activities and institutions for individual and social welfare



Economics

Hello friends !! hope you all are keeping fine. We took a short break in June. From July we start with a bang, with renewed vigour. Please treat your study material as your Bible. Read between the lines and study thoroughly. Because all your questions in the final exam will come from this study material only. So, try to understand the basic logic behind the economic theories and for Heaven's sake please do not try to mug-up. Let us now start our usual exercise of mock test.

I. Choose the correct answer:

- 1. Who was the father of Economics?**
 - A. Samuelson
 - B. Marshall
 - C. Robbins
 - D. Adam Smith

- 2. Price elasticity of demand will be highly inelastic if**
 - A. The good is a luxury item
 - B. It has a number of substitutes
 - C. It is a necessity item
 - D. None of the above

3. **If the price of a pen rises from Rs. 10 to Rs. 20 and as a result, the demand for it goes down from 300 to 200, calculate the price elasticity of demand**
 - A. 0.5
 - B. $1/3$
 - C. 0.2
 - D. None of the above

4. **What is the implication of the outward shift of the PPC curve away from the origin?**
 - A. Unemployment
 - B. Economic growth
 - C. Falling marginal rate of transformation
 - D. None of the above

5. **The vertical difference between TC and TVC curves is**
 - A. Marginal cost
 - B. Fixed cost
 - C. Opportunity cost
 - D. None of the above

6. **If the AC curve is falling, the marginal cost curve will be**
 - A. Rising
 - B. Falling
 - C. Falling and rising both
 - D. None of the above

7. **What is stagflation?**
 - A. When price increases and unemployment increases
 - B. When price increases and unemployment decreases
 - C. When price decreases and unemployment increases
 - D. None of the above

8. **Speculative demand for money depends on**
 - A. Rate of interest
 - B. Price level
 - C. Real income
 - D. None of the above

9. Recession can be cured through

- A. Sell of bonds
- B. Reduction of CRR
- C. Increase in the bank rate
- D. None of the above

10. Which one of the following is the primery function of money?

- A. Store of value
- B. Basis of credit
- C. Standard of deferred payments
- D. Medium of exchange

KEY:	1. D	2. C	3. B	4. B	5. B	6. C	7. A	8. A	9. B	10. D
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II. Fill in the blanks:

1. Giffen goods form a sub-set of the goods
2. Supply curve of labour is Bending
3. According to fisher's theory, money is demanded for purposes
4. Price rigidity is the feature of Market
5. The firm in monopoly is a price

KEY:	1. Inferior	2. Backward	3. Transaction	4. Oligopoly	5. Maker
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III. True or False:

1. When $MR=MC$, the firm will get maximum profit
2. Economic cost includes explicit cost + implicit cost + normal profit
3. Law of returns to scale can be found to occur in the short run
4. Profit is the only motivating factor of RBI
5. Product differentiation is the other name of monopoly

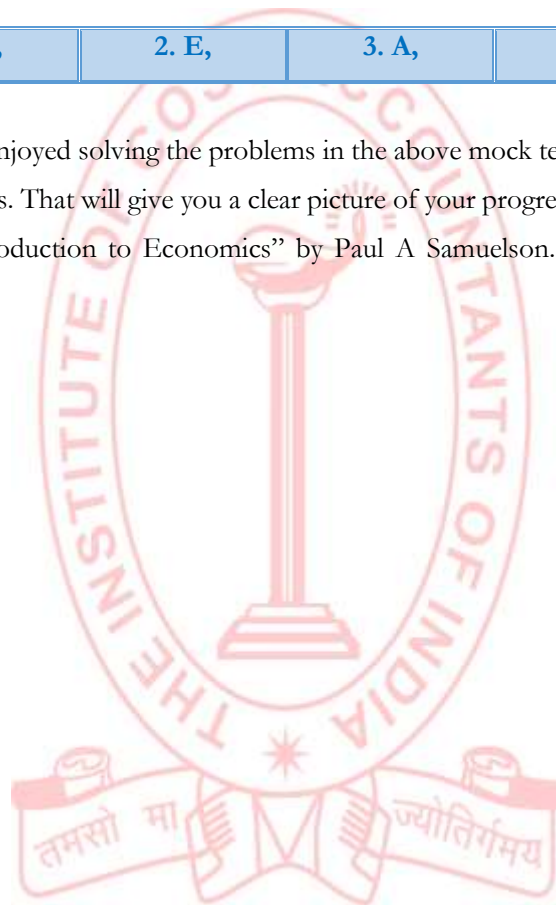
KEY:	1. True,	2. True,	3. False,	4. False,	5. False
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IV. Matching:

1. Liquidity	A. selling cost
2. Cournot's model	B. historical method
3. Monopolistic competition	C. money
4. Inductive method	D. scarcity definition
5. Robbins	E. duopoly

KEY:	1. C,	2. E,	3. A,	4. B,	5. D
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So friends!! Hope you have enjoyed solving the problems in the above mock test. Try to keep a record of your performance in the mock tests. That will give you a clear picture of your progress in the subject. As a reference book you may consult "Introduction to Economics" by Paul A Samuelson. Wish you best of luck in the examination!!



Fundamentals of Economics & Management (FEM)



PAPER: 1, PART: II

FUNDAMENTALS OF ECONOMICS & MANAGEMENT - (FEM) - MANAGEMENT

CMA (Dr.) Sumita Chakraborty
Additional Director,
Studies,
She can be reached at:
studies.addldir1@icmai.in

Your Preparation Quick



Syllabus Structure

A Fundamentals of Economics 50%
B Fundamentals of Management 50%

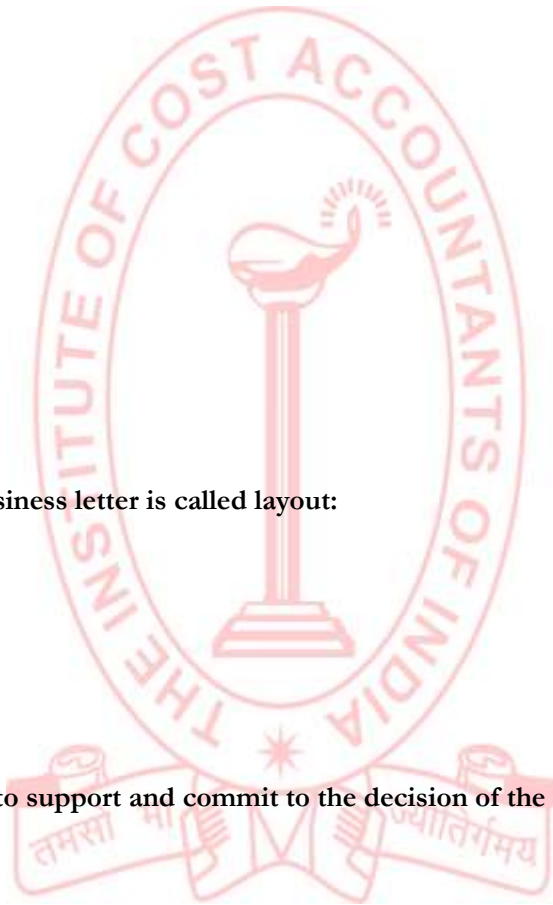
Learning Objectives:

- Students will demonstrate their knowledge of business and management principles
- Students will reveal effective written and oral communication
- Students will exhibit an awareness of the global environment in which businesses operate
- Students will display the ability to recognize when change is needed, adapt to change as it occurs, and lead

Management

- 1. The most important goal of business communication is:**
 - A. Favourable relationship between sender and receiver
 - B. Organizational goodwill
 - C. Receiver response
 - D. Receiver understanding
- 2. Downward communication flows from -----to-----**
 - A. Upper to lower
 - B. Lower to upper
 - C. Horizontal
 - D. Diagonal
- 3. The following is (are) non-verbal communication:**
 - A. Facial expression
 - B. Appearance
 - C. Posture
 - D. All of the above
- 4. The following is the permanent records for business:**
 - A. Business letters
 - B. Ledgers
 - C. Production reports
 - D. All of the above
- 5. The most modern letter style is:**
 - A. Modified block
 - B. Full block
 - C. Simplified
 - D. Block

6. Persuasive messages should be written in the ----- order:
- A. Indirect
 - B. Passive
 - C. Direct
 - D. Indecisive
7. Which of the following terms best describes the grapevine as a communication pattern?
- A. Diagonal
 - B. Informal
 - C. Serial
 - D. Verbal
8. Goals help us to:
- A. Communicate
 - B. Work
 - C. Success
 - D. Motivate
9. The -----of business letter is called layout:
- A. Body
 - B. Content
 - C. Pattern
 - D. All of the above
10. When a group agrees to support and commit to the decision of the group, they have reached:
- A. A consensus
 - B. A census
 - C. A solution
 - D. An analysis
11. Simplicity in writing means essentially:
- A. Plainness
 - B. The use of simple sentences
 - C. The use of simple tense
 - D. The use of simple words



12. Business letters produce immediate effect because those are:

- A. Interesting
- B. Brief
- C. Formal
- D. Informal

13. A memorandum (memo) is considered a brief form of written communication for:

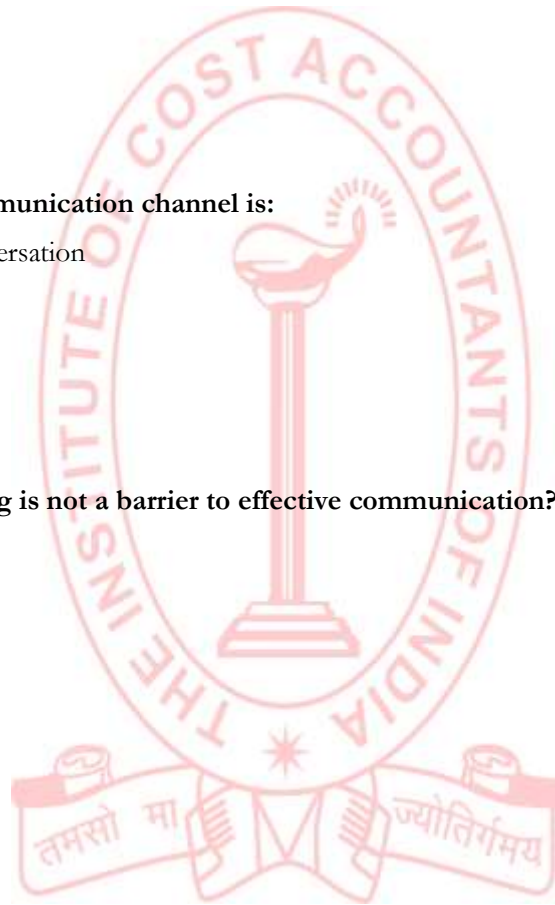
- A. Internal use
- B. External use
- C. Formal use
- D. Legal use

14. An example of a communication channel is:

- A. Face to face conversation
- B. Feedback
- C. Context
- D. Noise

15. Which of the following is not a barrier to effective communication?

- A. Language
- B. Defensiveness
- C. Filtering
- D. Channel richness



ANSWER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	A	D	A	C	A	B	A	C	A	A	D	A	A	D

Fundamentals of Accounting (FOA)



PAPER: 2

FUNDAMENTALS OF ACCOUNTING (FOA)

CMA (Dr.) Nibir Goswami
Associate Professor in
Commerce
Vidyasagar Mahavidyalaya,
W.B.
He can be reached at:
drnibirgoswami@gmail.com

Your Preparation Quick



Syllabus Structure

- A Fundamentals of Financial Accounting 80%
- B Fundamental of Cost Accounting 20%

Learning Objectives:

In order to internalize the concepts of subjects like accountancy one has to have an understanding of the learning objectives of the chapters. Try to go through the Statement of Objects and Reasons issued for every topics as it would give you a background to your study.

Financial of Accounting

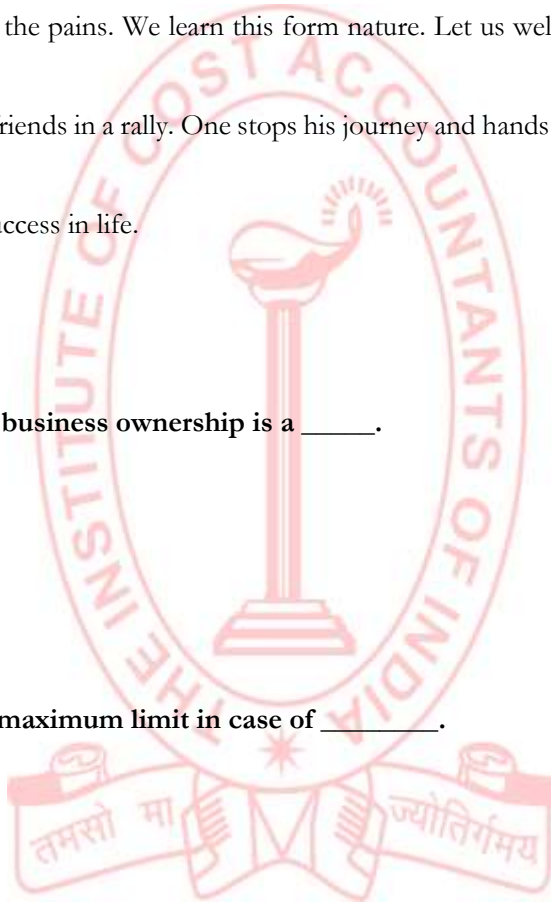
Happy Bengali New Year Day to all. Unlike English calendar this day falls in summer. Life is such - sometimes it burns; sometimes it washes the pains. We learn this from nature. Let us welcome summer and wait for the rain to come.

Seasons are like partners and friends in a rally. One stops his journey and hands over the baton to the next. The run continues.

Keep running. Wish you all success in life.

Objective Type Questions

- The simplest form of business ownership is a _____.**
 - Proprietorship
 - Partnership
 - Corporation
 - Cooperative
- At least 10 adults, no maximum limit in case of _____.**
 - Cooperative Society
 - Joint Hindu Family
 - Partnership
 - Company
- The main disadvantage of a general partnership is _____.**
 - The unlimited liability of the partners
 - Disagreement amongst partners
 - Shared management
 - Difficulty of termination



4. **The major advantage of a franchise is _____.**
- (a) Training and management assistance
 - (b) Personal ownership
 - (c) Nationally recognised name
 - (d) All of the above
5. **Profits do not have to be shared. This statement refers to _____.**
- (a) Company
 - (b) Sole proprietorship
 - (c) Joint Hindu family business
 - (d) Partnership
6. **The form of business organisation that has the largest sales volume is the _____.**
- (a) Partnership
 - (b) Corporation
 - (c) Cooperative
 - (d) Multinational
7. **Which of the following is probably the most important reason for incorporating?**
- (a) Limited liability of shareholders
 - (b) More money for investment
 - (c) Increased flexibility
 - (d) Shared management
8. **The structure in which there is a separation of ownership and management as per law is called _____.**
- (a) Company
 - (b) All business organisations
 - (c) Partnership
 - (d) Sole proprietorship
9. **Provision of residential accommodation to the members at reasonable rates is the objective of _____.**
- (a) Consumers cooperative
 - (b) Credit cooperative
 - (c) Housing cooperative

- (d) Producers cooperative
10. **In a cooperative society, the principle followed is _____.**
- (a) One share, one vote
(b) One man, one vote
(c) No vote
(d) Multiple votes
11. **Which of the following is an advantage of a sole proprietorship?**
- (a) Ease of starting a business
(b) Being your own boss
(c) Pride of ownership
(d) All of the above
12. **In case of _____, registration is compulsory.**
- (a) Sole Proprietorship
(b) Partnership
(c) Company
(d) None of these
13. **A partner whose association with the firm is unknown to the general public is called _____.**
- (a) Active partner
(b) Sleeping partner
(c) Nominal partner
(d) Secret partner
14. **The Karta in the Joint Hindu family business has _____.**
- (a) No liability for debts
(b) Unlimited liability
(c) Joint liability
(d) Limited liability
15. **A partner who is not actually involved in the partnership but lends his name for public relations purposes is a _____.**
- (a) Silent partner
(b) General partner
(c) Nominal partner
(d) Dominant partner

ANSWER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
(a)	(a)	(a)	(d)	(b)	(b)	(a)	(a)	(c)	(b)	(d)	(c)	(d)	(b)	(c)

Fundamentals of Laws and Ethics (FLE)



PAPER: 3

FUNDAMENTALS OF LAWS AND ETHICS (FLE)

CA Partha Ray

He can be reached at:

prapray@rediffmail.com

Your Preparation Quick



Syllabus Structure

- A Fundamentals of Commercial Laws 70%
- B Fundamentals of Ethics 30%

Learning Objectives:

- Read the Study Material minutely.
- For details or if you don't understand Study Material or the section is important to identify the topic, then refer to Bare Act, otherwise reference to Bare Act is not necessary. For Company Law, book by Avtar Singh is recommended. For other laws Institute Study Material is sufficient.
- The words used in any of the texts as mentioned above should be understood by immediate reference to the Dictionary.
- The main points coming out in any of the provisions should be either underlined or written in separate copy which has to be repeated again and again.
- Theoretical knowledge should be adequate and clear before solving practical problems.
- Don't write wrong English. It changes the meaning and therefore answer may be wrong even when the student's conception is clear. Also don't make spelling mistakes.

Law and Ethics

It is hoped that you keep on reading and recapitulating all that you have read for which you must prepare a time-table with time allotted for each subject – to read, write and revise.

Now, let us understand why this paper is really very important for all of you who are aspiring to be true professionals and are all eager to proudly proclaim aloud that – **Yes, behind every successful decision, there is a CMA.** With Mission CMA in mind, the students are advised to study this paper with a practical approach, as if the points concern you and you are given to deal with it as a professional. As a CMA in the making whether you decide to get employed or be self-employed and employ people, you will have to deal with Offers and Acceptances legally and establish Legal relationship for lawful consideration and perform your professional duties. Keeping that in mind, you have to study this subject seriously.

The first TIP is that you start studying the subject and raise questions to yourself first and then find your own answers. Even as a student now, you must start thinking like A Teacher.

Indian Contract Act, 1872

Ask yourself -*How do I make an offer?*

The answer is that there are certain **Rules regarding Offer** which are: **1. (i). An offer can be in words spoken or written** and **(ii). An offer can be implied by conduct.** For example: X tells Y by word of mouth or in writing that he wants to sell his Mobile Phone for Rs.5000 that is an offer when Y accepts it, there is a contract. The State Transport Corporation runs a Bus from Location A to location B along a fixed route. Here it is implied by conduct that the bus is offering to carry passengers against a specific fare structure. When a passenger boards the bus it is implied that he accepts to offer and wants to become a passenger. Here too, there is a

implied contract. **2. The terms of offer must be certain.** Example: When the passenger boards the bus, he accepts to pay the specific fare and follow certain terms offered. **3. A simple intention to sell is not an offer or an advertisement is an invitation to make an offer but is not an offer.** For example: A told C that his old mobile phone was fetching him Rs.5000 but he did not say that he was willing to sell at that price. Here there is no contract between A and C. **4. An offer must be communicated and the offeree must be aware of such offer.** **5. If an offer is conditional, such conditions must be clearly communicated to the offeree.**

So, we arrive at the obvious question –

How should I communicate the offer to other person/s?

As said above, **an offer can be in words spoken or written** and (ii). **An offer can be implied by conduct.** The offer by the bus to move along a specified route and carry passengers is a clear example of an offer by conduct.

Section 2(b) states that a proposal when **accepted** becomes a promise. So, the question arises – **What are the Rules regarding Acceptance?**

The answer is that –1. Sec.7(1) lays that ***an acceptance must be absolute and unqualified.*** Even, if a insignificant point of variation between the terms of offer and the terms of acceptance is found, there is no contract. For example: You offer to sell your Office Premises to Y for Rs.5,00,000 and no payment term was laid. Y sends you a bank draft for Rs.1,00,000 and promises to pay the balance Rs,4,00,000 after 2 months. So, here the acceptance is conditional and so there is no contract. **2. An acceptance must be expressed in a usual or reasonable manner.** (Refer Sec,7(2). Such acceptance can be by word of mouth, in writing or by post or even by conduct, but the offeree must do what the offeror wants him to do. (Refer Sec.8). **3. A mental acceptance is not a contract. Moreover, an acceptance which is not communicated is not a contract.** For example: You write to your friend X that you want to sell your Motorcycle for Rs. 10,000. Your friend mentally decides to buy the motorcycle and even writes a letter addressed to you, but forgets to post the letter to you or verbally inform you. This does not result in a contract. **4. If the Offeror prescribes a specific mode of acceptance, the Offeree must follow that particular mode unless the offeror waives it.** (Read Sec.7(2), **5.** Both the Communication of the Offer and the communication of the Acceptance must be complete. Another point is that the acceptance must be made till the offer is in force. For example: A desires to sell his Motor Car for Rs. 50,000 before 31st January,2018, such an offer is not valid after 31st January,2018.

Now, let us deal with the Sale of Goods Act, 1930

To start with, let us **explain the difference between a Condition and a Warranty.**

Sec.12 of the Sale of Goods Act defines conditions and warranties.

In a Contract of Sale, the terms or the stipulations laid, with reference to purchase and sale of goods, can be conditions or warranties.

We must understand that, a **Condition** is a stipulation which is **Essential** to the main objective/purpose of the contract. Any breach/violation of such condition/s may call for repudiation of the contract.

On the other hand, a **Warranty** is also a stipulation but such stipulation is **Collateral** to the main objective/purpose of the contract. Any breach/violation of such warranty may call for **Claim for damages**, but the contract can neither be repudiated nor can the goods be rejected.

So, we understand that both Condition and Warranty are terms/stipulations laid in a Contract of Sale, but whether the terms/stipulations are conditions or stipulations, depends on how the terms are laid, meant and construed to be understood in the contract. In many cases it is seen that a term in a contract is called as warranty but is actually a condition laid and such interpretations are left for the courts to decide.

Sec.11 of the Sale of Goods Act, lays that a stipulation as to time of payment, must not be deemed as conditions unless the terms of contract throws some indication to such intentions. Both conditions and warranties can be indicated in writing or may be implied on case to case basis, depending on the terms of the contract.

Suppose a contract of sale specifies a condition that goods sold shall be repaired at the premises of the buyer. This condition can be waived by the buyer who decides to carry the goods to the repair shop himself for repairs. In such a case the condition can be treated as a warranty. A buyer may even decide to treat a breach of condition as a breach of warranty and in such cases the buyer cannot repudiate or reject the goods but can accept the goods and sue for damages suffered.

That takes us to the question – **what are the implied conditions and warranties in a contract of sale of goods?**

Please read Sections 14 to 17 of the Sale of Goods Act. **The implied conditions and warranties in a contract of sale of goods** are as follows:

Implied Conditions –

1. Title – that the seller has the right to sell the goods and that he shall have the right to sell the goods at the time when the property in the goods is to pass.

2. Description – that the goods shall correspond to the description – physical characteristics, mention of trade mark, brand, etc. under which the sale agreement was made or those goods are normally sold. It is expected that the goods will be same as the goods described.
3. Sample – that goods shall be supplied as per the sample shown and agreed upon. That the buyer will get the opportunity of comparing the goods supplied with the earlier sample shown and the quality of the goods supplied matches with the quality of the sample shown and that the defects, if any, cannot be detected apparently on reasonable examination and inspection.
4. Sample and Description – where goods are sold by sample as well as by description, it is expected that the goods will correspond both - with the sample and the description.
5. Fitness or Quality – Where the buyer tells the seller about the purpose for which the goods are required, and relies on the seller's skill or judgment, it is implied that the seller agrees to the implied condition of fitness and description of the goods. Where the supplier deals in goods of such description laid by the buyer, it is implied that the goods shall be of desired quality and fit for sale – whether manufactured or traded by the supplier. However, if the goods are bought after inspection by the buyer, it will be implied that the inspection of the goods bought ought to have detected and revealed the defects.

Implied Warranties -

1. That the buyer shall have quiet possession of the goods, that is, the vendor has the right to transfer the goods,
2. That the goods are free from any charge or encumbrances in favour of any third party, not known to the buyer or not revealed to the buyer at the time of the contract.
3. That a warranty as to fitness for a particular purpose may be annexed to a contract of sale by normal practice in trade or a custom or usage.

Now, let us discuss about – **Performance of the Contract of Sale**

In any contract of sale, there has to be two parties – the **Buyer and the Seller**. Both are expected to perform as per agreed terms – The **Seller to deliver the goods and the buyer to accept the goods and pay the price.**

The seller is obliged to deliver the goods as per the terms of contract at the specified – time, place, quantity and quantity. **The buyer is obliged to accept the goods and pay the agreed price.** Depending on the terms of the contract, the payment can be taken in advance, or on stipulated period of credit and the delivery too can be off-the-shelf, ex-godown, free-on-board, staggered etc.

Performance of a contract depends on two criteria – **timely delivery by the supplier and agreed payment terms of the buyer.** The seller shall be ready to give possession of the goods in exchange for payment of the price and the buyer to be ready to take possession of the goods from the seller in exchange for price.

- 1) **Delivery can mean Physical or actual transfer of possession from one person to another**
- 2) **Delivery can be through different modes – viz.**
 - a) **Actual Delivery** – where the goods are physically delivered to the buyer by the seller – directly or through an agent.
 - b) **Symbolic** – just as we see in reality shows where the keys of a motor car is handed over to the winner
 - c) **Constructive** – where the delivery order is issued to a third party for making delivery – Example – A Company selling Potatoes, issuing Delivery Order to the Cold Storage in a different location asking them to deliver certain Number of Potato Bags to the buyer on receipt of the Issue Slip.

Auction Sale:

In an auction sale, there is an Auctioneer who is appointed by the owner of a property to sell property by inviting bids publicly and the property is sold to the highest bidder. However, the Auctioneer warrants the following:-

1. That the auctioneer has authority to sell
2. That the auctioneer has no knowledge that property under sale on behalf of his principal has any defects as to title; and
3. The buyer shall get quiet title to the possession of the property against payment of a price.

The question arises, what could be the **Rules regarding Sales by auction?**

Section 64 of the Sale of Goods Acts lays the rules which are as follows:

1. Where the goods are put to sale in lots, each lot is deemed to be subject to separate contract of sale;
2. The sale is complete only after the customary fall of the hammer when the auctioneer repeats the final offer **three times and** announces the completion of the sale. Until the fall of the hammer the bidder may retract his/her bid. The fall of the hammer amounts to acceptance of the offer.
3. The Seller may expressly reserve his right to bid in the auction. Such a sale has to be notified in advance. If such a right is expressly reserved, seller or any other person on his behalf may, bid at the auction. It may be kept in mind that without any express reservation and advance notification, the seller or any person on his behalf, cannot bid at an auction as it shall not be lawful and considered as fraudulent by the buyer acting on behalf of the seller.
4. The sale may be notified to be subject to a Reserved Price, that is, a price below which the goods/property will not be sold. The Reserve Price can be kept secret.

Where the seller resorts to pretended bidding, just to raise the price, the sale becomes voidable at the opinion of the buyer.

Fundamentals of Business Mathematics and Statistics (FBMS)



PAPER: 4

FUNDAMENTALS OF BUSINESS MATHEMATICS AND STATISTICS (FBMS)

CA Ankan K Bandyopadhyaya
He can be reached at:
abanerjee8533@gmail.com

Your Preparation Quick



Syllabus Structure

A Fundamentals of Business Mathematics 40%
B Fundamentals of Business Statistic 60%

Learning Objectives:

- To understand the basic concepts and needs of Business Mathematics.
- To Know the reasonableness and explanation in calculation.
- To know the application of various mathematical techniques.

Business Mathematics and Statistics

In this issue we will do discussions on fundamentals of Probability.

In general probability is the chance of **something** that will happen.

In a tossing of a R5 coin, either head will appear or tail. This appearing of head or tail in the toss is the something mentioned in the previous line

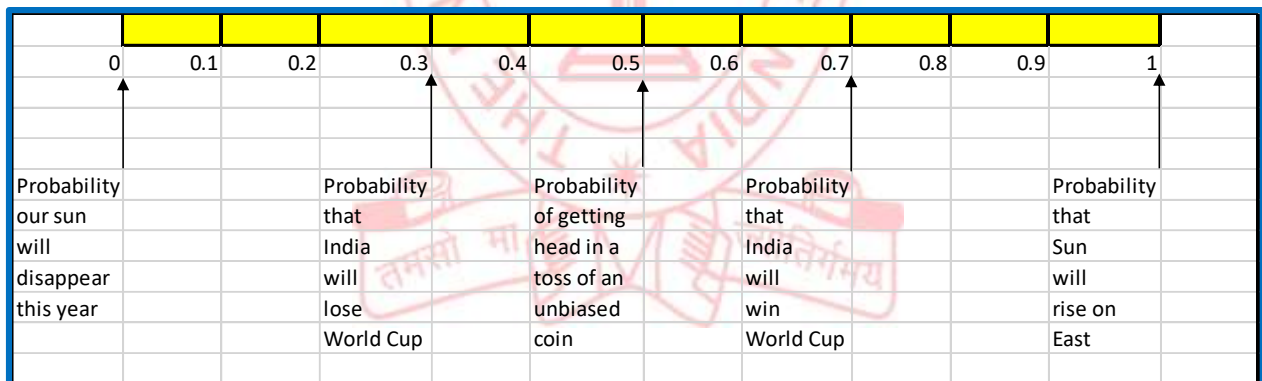
If we toss the coin are you certain head will come? Answer is just NO. Head may come or tail may come. So we are not certain, we depend on chance. This chance is statistically called **Probability**.

Probabilities are expressed as fractions ($1/3$, $2/3$, $4/5$) or as decimals (0.333, 0.667, 0.8) between zero and 1.

Probability 0 means that something will never happen---- in a tossing of coin the coin will never land on its edge).

Probability 1 means that something will certainly happen---- in a tossing of coin the coin will always show head or tail.

For better understanding refer the following figure:



The word “something” in aforesaid few statements is statistically called **Event**. Disappearing of Sun, India losing world cup, getting head in a toss, rising of sun etc. the above figure are all events.

Thus **Probability** is a value between zero and one, inclusive, describing the relative possibility (chance or likelihood) of an event will occur.

In probability theory an event is one or more of the possible outcomes of doing an **activity**. If we toss a coin— Tossing of the coin is the activity

Coming head or tail in the toss is the outcome or Event.

Getting head is an event. Getting tail is another event. In playing dice getting (●) or (●●), or (●●●) or (●●●●) or (●●●●●) or (●●●●●●) all are events.

Tossing of a coin, or playing dice is called Activity. In statistical terms activity is called **Experiment**.

With this formal statistical language we could put questions like---

In a coin-toss experiment what is the probability of the event head?

If the coin is unbiased i.e. if the coin is fair there is an equal chance of coming down on either side. And therefore the answers to the above sort of questions:

Chance of getting head---probability of getting head = $\frac{1}{2} = 0.5$;

Or

Chance of getting tail---probability of getting tail = $\frac{1}{2} = 0.5$;

Now it is clear that

We have done one activity----one experiment---- Tossing of a coin once;

This activity has two outcomes/events----- either getting Head or getting Tail;

The set of all possible outcomes of an experiment is called the **Sample Space** for the experiment. In the aforesaid coin-toss experiment the sample space is:

$$S = (\text{Head}, \text{Tail}) = (H, T)$$

In the experiment of playing the dice once the sample space is:

$$S = [(●), (●●), (●●●), (●●●●), (●●●●●), (●●●●●●)]$$

Note that in the event of tossing a coin once either we will get Head or Tail but not both together. Same we could say in playing dice once. Either we will get ((●) or (●●), or (●●●) or (●●●●) or (●●●●●) or (●●●●●●) not altogether.

Such type of events are said to be **Mutually Exclusive** if one and only one of them can take place at a time.

Some example of Mutually Exclusive events:

Getting head or tail in an experiment of tossing a coin;

Getting Spade or Club or Diamond or Heart in an experiment of drawing a card from a pack of 52 cards;

Passing or Failing in an experiment of appearing in an examination;

Medicine can be effective or non-effective in an experiment of treating a disease with medicine;

The crucial question to ask in deciding whether events are really mutually exclusive is:

Can two or more events occur at one time in an experiment?

If the answer to the above question is yes then the events are not mutually exclusive.

When the sample space of the possible events that can result from an experiment includes every possible outcome, the list is called **Collectively Exhaustive**.

In an experiment of tossing a coin collective exhaustive list is (H, T)

In an experiment of playing dice collective exhaustive list is

$$[(\bullet), (\bullet\bullet), (\bullet\bullet\bullet), (\bullet\bullet\bullet\bullet), (\bullet\bullet\bullet\bullet\bullet), (\bullet\bullet\bullet\bullet\bullet\bullet)]$$

In an election with 3 parties A,B,C, event of winning the election if listed as (A,B) then the list is not a collective exhaustive list as C also could win the election and it would be also an event.

Illustration:

Give a collectively exhaustive list of the possible outcomes of tossing two dice.

Answer: The list is placed below:

(1,1)	(1,2)	(1,3)	(1,4)	(1,5)	(1,6)
(2,1)	(2,2)	(2,3)	(2,4)	(2,5)	(2,6)
(3,1)	(3,2)	(3,3)	(3,4)	(3,5)	(3,6)
(4,1)	(4,2)	(4,3)	(4,4)	(4,5)	(4,6)
(5,1)	(5,2)	(5,3)	(5,4)	(5,5)	(5,6)
(6,1)	(6,2)	(6,3)	(6,4)	(6,5)	(6,6)

Illustration:

Which of the following are pairs of mutually exclusive events in the drawing of a single card from a standard deck of 52?

- A Heart and a Queen;
- A Club and a Red card;
- An even number and a Spade;
- An Ace and an even number;

Answer: Mutually exclusive events are (b), (d)

Illustration:

Which of the following are mutually exclusive outcomes in the rolling of two dice?

- A total of 5 and a 5 on one die;
- A total of 7 and an even number of points on both dice;
- A total of 8 and an odd number of points on both dice;
- A total of 9 points and a 2 on one die;
- A total of 10 points and a 4 on one die;

Answer: Mutually exclusive events are (a), (b), and (d).

Illustration:

State Government recently developed a new app for solving the parking problem in the metro city. Its functionality is to be tested by 100 senior traffic sergeants. On the basis of discussions made in the previous paras answer the following:

- What is the experiment?
- What is one possible event?
- Suppose out of 100 sergeants, 55 sergeants liked the app for solving parking problem in their zones. Is 55 a probability?
- The probability that the app is functionality good is 1.05. Is the statement correct? Comment
- Specify one possible probability of a possible event

Answer:

- Count the number of sergeants who think the app is functionally good for solving parking problems in the city
- Eighty one sergeants approves the functionality of the app (there could be other answers)
- No. probability cannot be greater than 1. In this case correct indication through probability will be $\frac{55}{100} = 0.55$
- No. Probability cannot be greater than 1.
- 60 percent sergeants approved the functionality of the app

In probability theory we use symbols to simplify the presentation of ideas.

Probability of event A is denoted as P (A)



P (A) indicates occurrence of only one event. Like Probability of getting Head P (H) or Probability of getting Tail P (T) in an experiment of tossing a coin

P (A) ---P (H) ---P (T)

Probability of an event = $\frac{\text{no of times the concerned event occurs in the sample space}}{\text{Total no of events in the sample space}}$

There are three ways to assign a probability to an event: i) Classical probability; ii) Empirical probability; iii) Subjective probability

Classical Probability:

Also called a **priori** probability. Why?

We know that probability is the chance of occurring an event in an experiment. In case of some experiments we could give answers without actually performing the experiment. Say for example experiment is tossing a coin. Possible events are i) getting a Head; ii) getting a Tail

So the sample space is $S = (H, T)$

So we could conclude $P(H) = \frac{\text{no of times the concerned event occurs in the sample space}}{\text{Total no of events in the sample space}} = \frac{1}{2}$

In determining this probability we don't require to do an actual toss of a coin. Without tossing the coin we could assign the probability to the event of getting head in a toss of a coin. These type of experiments generate classical probability. Off course we have to assume that the coin is unbiased and so the outcomes of such experiment (getting head or tail in an experiment of tossing an unbiased coin) are equally likely.

Using this classical viewpoint the probability of an event:

$$\text{Probability of an event} = \frac{\text{Number of favourable outcomes}}{\text{Total no of possible outcomes}}$$

In classical probability value of the numerator and value of the denominator both we could assign without carrying the experiment in true sense. Other examples

- a) Rolling an unbiased dice – e.g. Probability of getting even numbers from a single rolling
- b) Playing on a pack of well shuffled cards – e.g. Probability of getting red cards from a drawing of one card
- c) Fighting an election in a constituency—e.g. Probability of winning the election fought by 6 candidates

Empirical Probability:

If it is asked “what is the probability of a candidate’s passing the CMA examination?” Or “what is the probability of candidate’s passing the CMA examination in one attempt?”

On the basis of classical probability no one could answer these questions correctly as a priori. In business decisions events occur not in orderly fashion as assumed in classical probability and so empirical probability comes into picture.

Thus empirical probability of an event happening is the fraction of the time similar events happened in the past. i.e. Historical data would help us in assigning the probability. In answering candidate’s passing of CMA examination either in first attempt or in multiple attempts, we require history of performance of candidates in CMA exam.

Say for example a launching station like ISRO is planning to launch a satellite on 15th August 2023. What is the probability of its success?

We could not answer this question as a priori. To answer this question we have to rely on historical evidence on success of satellite launching by ISRO. The history shows that till 30th March, 2023 469 launches of satellites were made by the launching station out of which 11 were failure. So (469 – 11) i.e. 458 times satellite launching got success. Therefore the requisite answer to our question would be $\frac{458}{469} = 0.97$ i.e. 97% chance satellite launching on 15th August 2023 would be a success.

Thus *Empirical probability* = $\frac{\text{No of times the requisite event occurs}}{\text{Total no of observations}}$

In empirical probability value of the numerator and value of the denominator both we could assign with carrying out the experiment in true sense.

In last term out of 1000 candidates 100 candidates passed the CMA examination in one attempt. So likelihood of your passing the CMA examination in one attempt may be $100/1000 = 0.10$

Assignment of empirical probability to an event so called **Relative Frequency Approach**. This method uses the relative frequencies of past occurrences as probabilities. We determine how often something has happened in the past and use that figure to predict the probability that it will happen again in the future.

Subjective Probability:

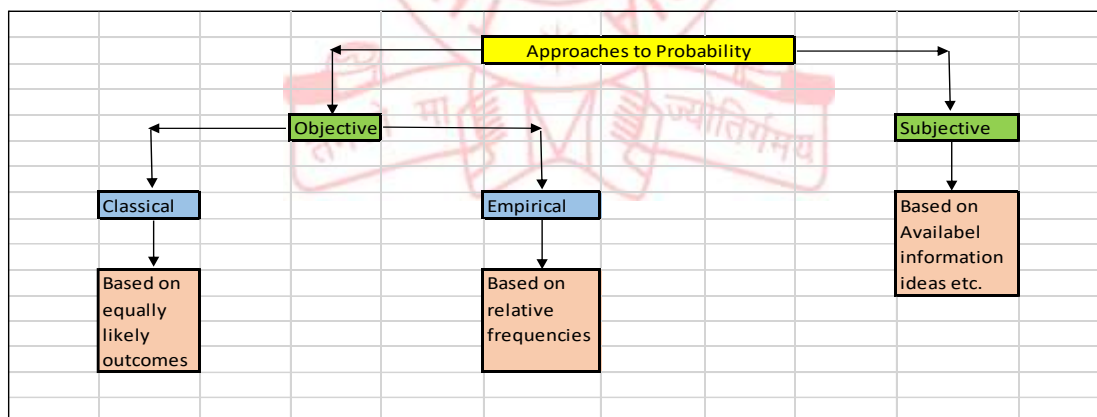
If there is little or no experience or information on which to base a probability, it is estimated subjectively. Subjective probability assignments are frequently found when events occur only once or at most a very few times. Under this an individual evaluates the available opinions, information, beliefs etc. For example

Estimating the likelihood that Joshimoto will be capsized due to severe land slide

Estimating the likelihood that you are involved in a space accident during your first space tour

Estimating the likelihood that INDIA will be a 6 trillion economy in the next year

Thus we could conclude the approaches to probability as follows:



* In a toss of coin occurrence of head or tail are equally likely (0.5:0.5);

* In a CMA examination occurrence of pass or fail candidates are not equally likely

[Objective means making an unbiased, balanced observation based on facts which can be verified. Subjective means making assumptions, making interpretations based on personal opinions without any verifiable facts]

Illustration:

One card will be drawn randomly from a standard 52 card deck. What is the probability the card will be a queen? Which approach to probability did you use to answer this question?

Answer:

In a pack of 52 cards there will be always 4 queen cards – 1 Queen of Heart cards, 1 Queen of Diamond cards, 1 queen of Spade cards, 1 Queen of Club cards. We know these fact in advance without actual verification. So through object oriented classical approach the required probability is $4/52$. Personal opinion, belief etc. will never influence this probability assignment.

Illustration:

The National Child Care Protection (NCCP) team recently published a report on 500 children from a posh locality of a city and the marital status of their parents. There are 300 married, 180 divorced and 20 widowed parents. What is the probability that a particular child chosen at random will have a parent who is divorced? Which approach to probability did you use to answer this question?

Answer:

In a group of 500 children, we can never determine the marital status of their parents in advance without actual verification. So through object oriented empirical approach the required probability is $180/500$. Personal opinion, belief etc. will never influence this probability assignment.

Illustration:

What is the probability that you will save one Crore rupee by the time you retire? Which approach to probability did you use to answer this question?

Answer:

The answer to this sort of probability assignment is heavily dependent on personal belief, opinion, and some other information which are not verifiable. So through subjective probability approach the required probability could be anything from 0 to 1.

Illustration:

Some people are in favour of reducing Income tax to increase consumer spending and others are against it. Two persons are selected and their opinions are recorded. Assuming no one is undecided, draw the sample space.

Answer:

Let F is the event of favouring the reduction of Income tax and A is the event of not favouring the reduction of Income tax

So ample space is $S: \{FF, FA, AA, AF\}$

This is an empirical approach because a person's opinion cannot be ascertained in advance without actual verification.

Illustration:

A quality control inspector selects a part to be tested. The part is then declared acceptable, repairable or scrapped. Then another part is tested. List the possible outcomes of this experiment regarding two parts.

Answer:

Let A is the event of getting acceptable feature, R is the event of getting repairable feature and S is the event of getting scrapped feature

So sample space is $S: \{AA, AR, AS, RR, RA, RS, SS, SA, SR\}$

Illustration:

A survey of 35 students at a college of business showed the following majors:

Accounting	10
Finance	5
Economics	3
Management	6
Marketing	11

Suppose you select a student observe his or her major.

- What is the probability he or she is a marketing major?
- Which concept of probability did you use to make the estimate?

Answer:

b) This is an empirical approach because a student's major cannot be ascertained in advance without actual interviewing.

$$a) \text{ Requisite Empirical probability} = \frac{\text{No of times the requisite event occurs}}{\text{Total no of observations}}$$

$$\text{Or,} = \frac{\text{No of students opted for Marketing major}}{\text{Total no of students}} = \frac{11}{35}$$

Illustration:

A large company must hire a new director. The shareholders prepares a list of five candidates, all of whom are equally qualified. Two of these candidates are members of a minority group. To avoid bias in the selection of the candidates, the company decides to select the director by lottery

- What is the probability of the minority candidate is hired?

b) Which concept of probability did you use to make this estimate?**Answer:**

The probability of the minority candidate is hired

$$= \frac{\text{Selection of one minority candidate out of two candidates}}{\text{Selection of one candidate out of five candidates}} = \frac{{}^2C_1}{{}^5C_1} = \frac{2}{5} \quad [\text{For better understanding selection,}$$

refer chapter on Permutations & Combinations]

b) This is a classical approach because the lottery result can be ascertained in advance without actual performance.

Illustration:

In each of the following cases, indicate whether classical, empirical or subjective probability is used:

- A baseball player gets a hit in 30 out of 100 times at bat. The probability is 0.3 that he gets a hit in his next at bat;
- A seven member committee of students is formed to study environmental issues. What is the likelihood that any one of the seven is randomly chosen as the spokesperson?
- You purchased 1 of 5 million tickets sold for Dear Lottery. What is the likelihood you will win R5 crores jackpot?
- The probability of an earthquake in Gujarat in the next 10 years above 6 on the Richter scale is 0.75

Answer:

- Empirical as probability is based on historical data
- Classical as probability could be ascertained before actual selection
- Classical as probability could be ascertained before actual lottery
- Empirical as probability is ascertained with seismological records

Illustration:

A sample of 50 steel industry executives was selected to test a questionnaire. One question about environmental issues required a yes or no answer.

- What is the experiment?
- List one possible event
- Twelve of the 50 executives responded yes. Based on these sample responses, what is the probability that an oil industry executive will respond yes?
- What concept of probability does this illustrate?
- Are each of the possible outcomes equally likely and mutually exclusive?

Answer:

- a) Survey of 50 executives about an environmental issues.
- b) 30 or more executives responded yes. [Many such answers are possible]
- c) Probability that an oil industry executive will respond yes = $\frac{12}{50} = 0.24$
- d) Empirical
- e) Each of the possible outcomes are not equally likely but mutually exclusive

Illustration:

State Bank of India customers select their own 4 digit PIN for use of Credit Card

- a) Think of this as an experiment and list four possible outcomes;
- b) What is the probability Mr. Banerjee and Mrs. Basu select the same PIN?
- c) What concept of probability did you use to answer (b)?

Answer:

a) There could be many possible outcomes. One possibility is $S = \{1234, 5987, 6257, 1111\}$

b) Suppose Mr. Banerjee and Mrs. Basu selected 8543 as PIN

So required probability is

$P =$

probability of selecting 8 out of 10 digit i. e. $1/10 *$

probability of selecting 5 out of 10 digit i. e. $1/10 *$

probability of selecting 4 out of 10 digit i. e. $1/10 *$

probability of selecting 3 out of 10 digit i. e. $1/10$

$$\text{Or, } P = \frac{1}{10} * \frac{1}{10} * \frac{1}{10} * \frac{1}{10} = \frac{1}{10^4}$$

c) Classical

Suggestions:

This study note need to be read thoroughly. Supplementary readings could be made from other resources. This issue is based on Statistics for Management by Richard I Levin and Statistics by Sancheti Kapoor. In this issue basic concepts of Probability is discussed as supplement to the discussions in the study guide. Students should try to understand the illustrations considered. Without clear concept in probability, now a day's thorough knowledge in finance arena would be impossible. For clear conception go thoroughly on the subject Guide book on the paper 3- Fundamental of Business mathematics and Statistics written and issued by Institute. Further discussions on Probability will be discussed in the next few issues of e-bulletin.

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03

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04

FINISHED

Submissions



SUBMISSIONS

Dear Students,

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We have noted your queries and your requests will definitely be carried out. Further, requesting you to go through the current edition of the bulletin. All the areas will be covered gradually. Expecting your responses further to serve you better as we believe that there is no end of excellencel One of the mails received is acknowledged below.

Please put your opinions so that we can make your e-bulletin everything that you want it to be.

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Message from Directorate of Studies

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- Certain general guidelines are listed below and which will help you in preparing for the examinations:
- Conceptual understanding and overall understanding of the subjects should be clear,
- Students are advised to go through the study material provided by the Institute meticulously,
- Students should know and learn the basic understandings of the subjects with focus on core concepts,
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- Proper time management is also important while answering.

Please refer the link mentioned below:

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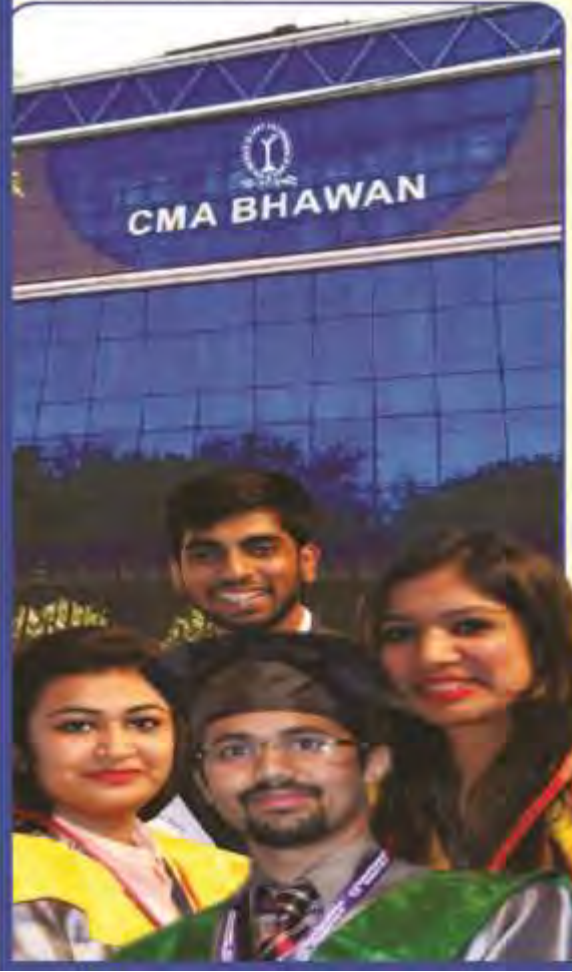
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Few Snapshots

Few Snapshots



CMA Ashwin G. Dalwadi has been elected as the President and CMA Bibhuti Bhusan Nayak as the Vice President, ICAI for the year 2023-24.



CMA Ashwin G. Dalwadi has been elected as the President and CMA Bibhuti Bhusan Nayak as the Vice President, ICAI for the year 2023-24.



CMA Navneet Kumar Jain, Council Member, ICAI, CMA Manish Kandpal, Secretary, NIRC-ICAI and CMA Jeewan Chandra met with Hon'ble Chief Minister of Uttarakhand, Shri Pushkar Singh Dhami and submitted representations.



CMA Ashwin G. Dalwadi, President, ICAI along with CMA Manoj Kumar Anand, Council Member, ICAI had a meeting with CS Manish Gupta, President, ICSI and CS Asish Mohan, Secretary, ICSI at CMA Bhawan, New Delhi on 25th July, 2023.



CMA Ashwin G. Dalwadi, President, ICAI along with CMA Manoj Kumar Anand, Council Member, ICAI called on Shri Manoj Govil, IAS, Secretary to the Government of India, Ministry of Corporate Affairs on 26th July, 2023.



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Headquarters: CMA Bhawan, 12, Sudder Street, Kolkata - 700 016

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Delhi office: CMA Bhawan, 3, Institutional Area, Lodhi Road, New Delhi - 110 003

Phone: +91-11-2462-2156/2157/2158