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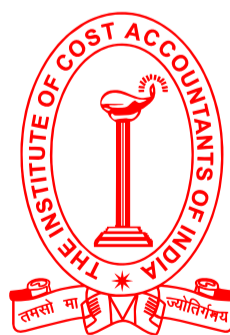
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CMA Student E - Bulletin

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Behind every successful business decision, there is always a **CMA**



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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.



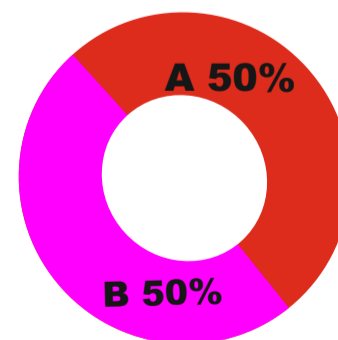
PAPER: 1, PART: I

FUNDAMENTALS

OF ECONOMICS & MANAGEMENT
(FEM) - ECONOMICS

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Your Preparation Quick Takes



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 behaviour 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

Hi friends! Hope you all are keeping fine. It is an excellent news that all the educational institutions are open now. So it is time to rejoice and have fun with your friends. But be very careful. Corona virus may mutate again and prepare for another assault. So use mask whenever you go out. Keep a bottle of sanitizer handy. Wash you hands thoroughly with soap whenever you return home. Try to avoid crowd. Stay safe. Health comes first, then education.

I. Choose the correct answer:

- Which one of the following is not an assumption of perfect competition?**
 - Single seller
 - Homogeneous product
 - Perfect knowledge
 - Free entry and free exit
- Who was the proponent of growth definition of economics?**
 - Adam Smith
 - Alfred Marshall
 - Lionel Robbins
 - Samuelson
- Which one of the following is not an assumption of Monopolistic competition?**
 - A few sellers
 - Homogeneous product
 - Free entry and free exit
 - Huge selling cost
- Total utility is maximum when**
 - marginal utility is zero
 - marginal utility is at its highest point
 - marginal utility is equal to average utility
 - average utility is maximum
- initial price=Rs.5 and demand=100; Final price=Rs.4 and demand=110. Find the Arc elasticity of demand.**
 - 9
 - 21
 - 9/21
 - 3/8
- When elasticity of demand is very high, marginal revenue is**
 - Positive
 - Negative
 - Zero
 - None of these
- In case of an inferior good, the income elasticity of demand is**
 - Positive
 - Zero
 - Negative
 - Infinite

8. Which of the following is selling cost?
- Expenditure on packing
 - Transportation cost
 - Advertisement expenditure
 - Wages paid to the workers
9. Given a reserve ratio of 10%, the initial deposit of Rs.1000 in a banking system would create secondary deposit of Rs.
- Rs,10,000
 - Rs. 9000
 - Rs. 5000
 - None of the above
10. RBI was nationalized in
- June 1947
 - Jan 1949
 - Mar 1954
 - April 1948

KEY: 1. A, 2. D, 3. B, 4. A, 5. C, 6. A, 7. C, 8. C, 9. B, 10. B

II. Fill in the blanks:

- When the increase in total output is proportional to the increase in factors, the firm has Returns to scale.
- When demand for a commodity exceeds its supply, the excess demand will push up the
- Apex body in the agricultural credit is
- International Development Association is affiliated to the
- If the bank rate increases, the demand for bank loan

KEY: 1. Constant, 2. Price, 3. NABARD, 4. World Bank, 5. Falls

III. True or False:

- In India, FERA has been replaced by FENA
- The policy which is implemented by the Govt. to control the purchasing power of money is called Fiscal policy
- Call money represents the amount borrowed by commercial banks from each other for short periods to meet their cash reserve requirements.
- If the seller charges different prices from different customers on the basis of paying capacity of the consumer, it is said to be price discrimination of the third degree.
- In the case of rare goods, supply cannot be changed according to the price.

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

IV. Matching:

1. SDR	A. 1956
2. LIC	B. 1969
3. EXIM Bank	C. Bank Cheque
4. Repo Rate	D. Foreign Trade
5. Near money	E. RBI

KEY: 1. B, 2. A, 3. D, 4. E, 5. C

Friends, I do hope that you have enjoyed solving the problems given in the mock test. Please do not consult the keys before you have solved the entire mock test. Keep track of your performance and record it for your own consumption. The record will give you an idea of your progress. Prepare hard for your exam and stay safe. Best of luck!!!



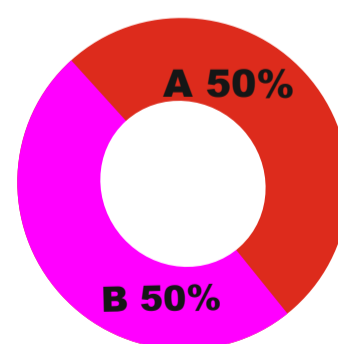
PAPER: 1, PART: II

FUNDAMENTALS

OF ECONOMICS & MANAGEMENT
(FEM) - MANAGEMENT

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Your Preparation Quick Takes



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. Management satisfies _____ characteristics of a profession

- A. Few
- B. Many
- C. All
- D. Zero

Answer: C

2. _____ represents the lower level management covering execution and implementation functions

- A. Administrative Management
- B. Operative management
- C. Co-operative management
- D. All of the above

Answer: B

3. Which is NOT an informational role of manager?

- A. Monitor's role
- B. Disturbance's handler role
- C. Disseminator's role
- D. Spokesman's role

Answer: B

4. MOST stands for _____

- A. Machinery, Office, Staff and Technology
- B. Mission, Objectives, Strategies and Tactics
- C. Maximum Output Strategy Tools
- D. Manager, Operator, Seller and Trader

Answer: B

5. Functional managers are responsible _____

- A. For a single area of activity
- B. To the upper level of management and staff
- C. For complex organizational sub-units
- D. For obtaining copyrights and patents for newly developed processes and equipment

Answer: A

6. Strategic planning as a broad concept consists of _____

- A. Corporate strategy and business strategy
- B. Strategy formulation and strategy implementation
- C. Inputs and outputs
- D. Environmental analysis and internal analysis

Answer: B

7. The most significant management skills are _____

- A. Technical, Human and Conceptual
- B. Technical, behavioural and Conceptual
- C. Systematic, Human and Conceptual
- D. Technical, Human and cognitive

Answer: A

8. Management is what a manager does _____
- A. Peter F. Drucker.
 - B. Terry.
 - C. Louis Allan.
 - D. Henry Fayol.

Answer: C

9. Management is the art of getting things done through and with an informally organized _____
- A. Harold Koontz.
 - B. Terry.
 - C. Louis Allan.
 - D. Henry Fayol.

Answer: A

10. Luther Gullik classifies the function of management as _____
- A. POSDCORB.
 - B. POSTCARD.
 - C. POSDCORB.
 - D. POSDORBC.

Answer: C

11. Espirit de corps means _____
- A. union is strength.
 - B. service is our motto.
 - C. buyer beware.
 - D. product is our strength.

Answer: A

12. Control system of an organisation has no influence over the _____
- A. internal environment.
 - B. external environment.
 - C. customers.
 - D. government.

ANSWER: B

13. Allotment of work to each worker on the basis of the capacity of an average worker functioning in the normal working condition is _____
- A. Social task planning.
 - B. Scientific task planning.
 - C. Not a planning.
 - D. Scientific organizing.

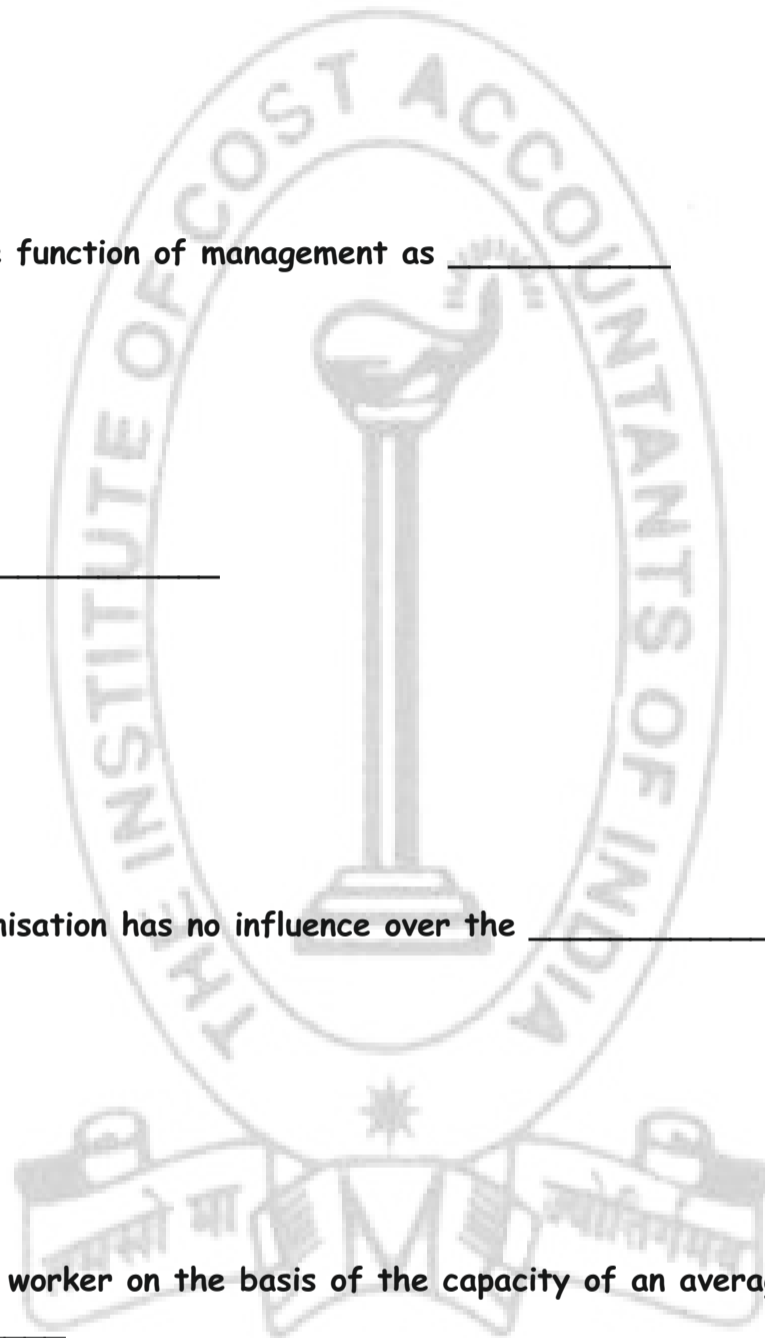
Answer: B

14. A study relating to the fixing of the working hours with rest periods to recoup the energy while performing in a job is called _____
- A. Fatigue study.
 - B. Time study.
 - C. Motion study.
 - D. Work-study.

Answer: A

15. Strategic planning is _____
- A. Long term planning.
 - B. Medium term planning.
 - C. Short term planning.
 - D. Annual planning.

Answer: A



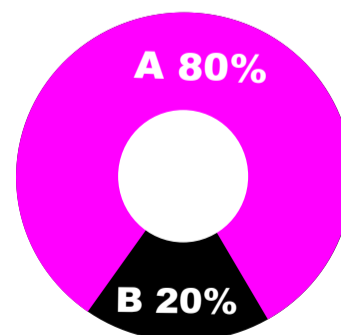


PAPER: 2

FUNDAMENTALS OF ACCOUNTING (FOA)

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Your Preparation Quick Takes



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

Mission is a very short-lived phenomenon. You should think for a vision which will drive to a very bright future. Never underestimate your power.

A man was walking nearby to a group of elephants that was halted by a small rope tied to their front leg. He was amazed by the fact that the huge elephants are not even making an attempt to break the rope and set themselves free.

He saw an elephant trainer standing beside them and he expressed his puzzled state of mind. The trainer said "when they are very young and much smaller we use the same size rope to tie them and, at that age, it's enough to hold them.

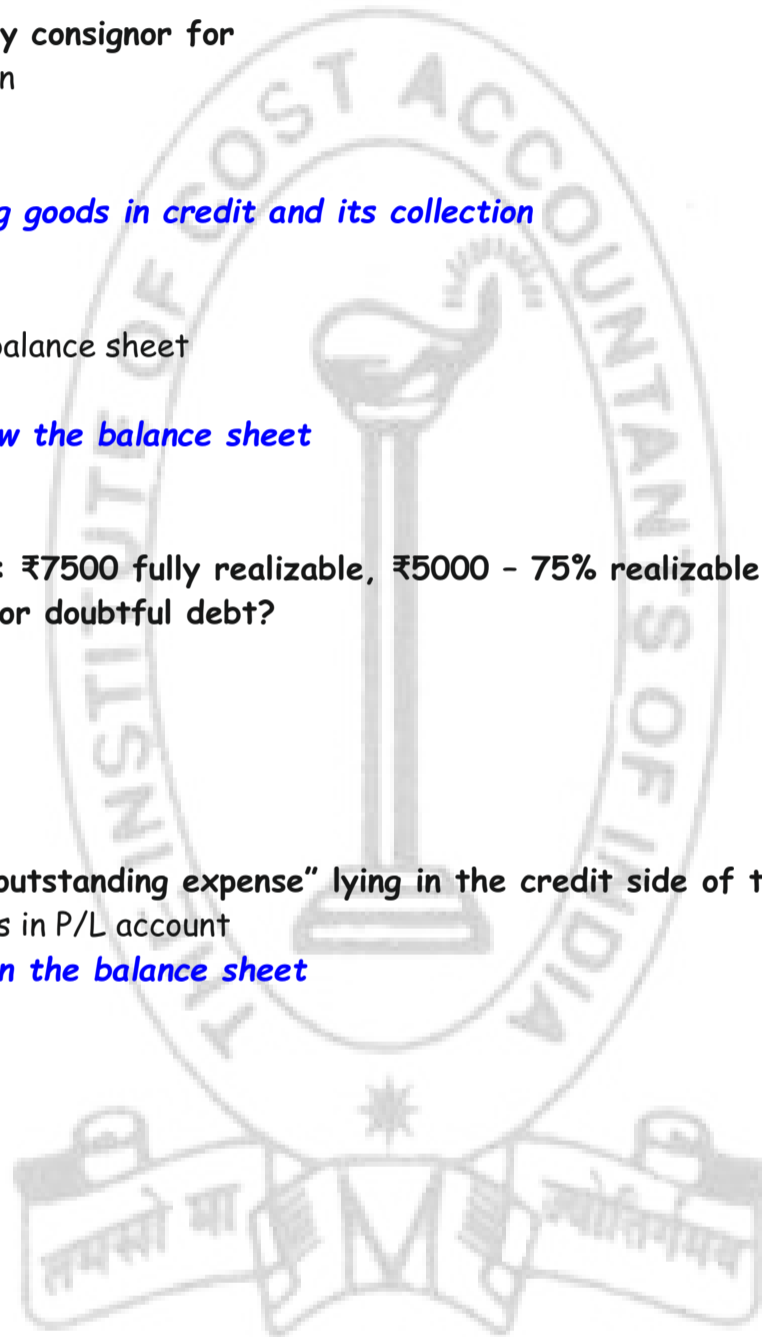
As they grow up, they are conditioned to believe they cannot break away. They believe the rope can still hold them, so they never try to break free."

Moral: It is the false belief of the elephants that denied their freedom for life time. Likewise, many people are not trying to work towards success in their life just because they failed once before. So keep on trying and don't get tied up with some false beliefs of failure.

Let us now explore our mind power of the subject with some simple exercise:

1. If Mr. X a debtor of Rs. 40000 becomes insolvent and 50 % of the rupee is recovered. What will be the Journal entry
 - a. Bad debt a/c .. Dr 20000 To P/L a/c 20000
 - b. Cash a/c .. Dr 40000 To debtors a/c 40000
 - c. **Bad Debt a/c .. dr 20000 to Debtors a/c 20000**
 - d. None of these
2. Rs. 5000 paid as rent wrongly debited to landlords account. What will be the rectifying entry
 - a. Rent a/c .. Dr 5000 To P/L a/c 5000
 - b. **Rent a/c .. Dr To Landlord a/c 5000**
 - c. Cash a/c .. 5000 Dr To Rent a/c ..5000
 - d. Rent a/c.. Dr 5000 To P/L a/c 5000
3. Cost of sales = cost of goods sold plus
 - a. Administration overhead
 - b. **Selling and distribution overhead**
 - c. Factory overhead
 - d. None of these
4. Which of the following statement is correct
 - a. Debit balance of Cash Book is overdraft
 - b. Credit balance of Pass Book is overdraft
 - c. Debit balance of the pass book is overdraft
 - d. **Credit balance of the Cash Book is overdraft**
5. Debit balance means
 - a. **Debit side is higher than credit side**
 - b. Credit side id higher than debit side
 - c. Both sides are equal
 - d. None of these
6. Wages paid for installation of machinery to be debited to
 - a. Wages account
 - b. Cash account
 - c. **Machinery account**

- d. Depreciation account
7. Rent paid in advance to be credited to
- Rent account**
 - Cash account
 - Prepaid rent account
 - None of these
8. Good distributed as free sample to be debited to
- Goods account
 - Sample account
 - Trading account
 - Advertisement account**
9. Del credere commission is paid by consignor for
- Hiring extra space in godown
 - Selling goods in cash
 - Selling goods in credit
 - Taking extra risk of selling goods in credit and its collection**
10. Contingent liability is written
- In the liability side of the balance sheet
 - Not written at all
 - Shown as a foot note below the balance sheet**
 - None of these
11. Scrutiny of debtors show that : ₹7500 fully realizable, ₹5000 - 75% realizable and ₹5000 - 50 % realizable. What will be the amount of provision for doubtful debt?
- 3250**
 - 3520
 - 4250
 - 5000
12. How will you treat an item of "outstanding expense" lying in the credit side of the trial balance?
- Will be added with expenses in P/L account
 - Will be shown as liability in the balance sheet**
 - Will not be treated at all
 - None of these



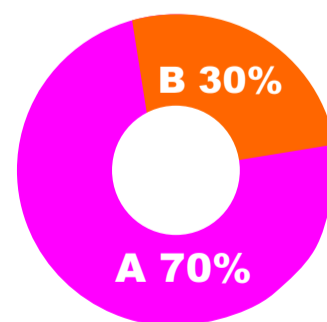


PAPER: 3

FUNDAMENTALS OF LAWS AND ETHICS (FLE)

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Your Preparation Quick Takes



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.

LAWS & ETHICS

It is hoped that you keep on reading and recapitulation 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.

Sale of Goods Act, 1930

Ask a question - There is a contract of sale between a buyer and a seller, **when does the property, pass on from the seller to the buyer in a contract for the sale of such goods?** You will find the answer in Sec.18 to 25 of the Sale of Goods Act. You have to reply keeping in mind each type of goods .

1. **In case of Specific Goods**, where there is an unconditional contract for sale of specific goods in a deliverable state, the property passes as soon as the contract is made. The time of payment or the time of delivery is not material.
2. **In case of Unspecified/Unascertained Goods**, the property is not transferred until the goods are ascertained. For example, there are bags of cement in a godown. The property gets transferred to the buyer only when the requisite number of bags are separated, taken out and kept aside for delivery to that buyer.
3. **The Intention of the Parties** is very important in case of sale of Specific goods. The property passes when the parties to the contract intend it to pass as stated in the terms of the contract.
4. In case of sale of Specific Goods, **if there is something which the seller has to do**, before making the goods ready in a deliverable condition, the property passes only after the seller has done that thing. For example, M agrees to sell 1000 tins of milk powder to N and promises to pack them in Card Board Boxes before delivery, the property passes only after those tins are properly packed and made ready for delivery.
5. In case of Specific goods, **where the seller has to measure, weigh or test the goods**, for the purpose of ascertaining the price, the property does not pass to the buyer as long as that thing has been done and the buyer is intimated.
6. Property in the goods is transferred to the buyer when the **goods is delivered to the carrier**. However, in case of conditional delivery, the property is transferred only if that condition is fulfilled. For example if M -the seller, sends goods by courier to N - the buyer, the property is transferred as soon as the goods are handed over to the courier, but if there is a condition of Cash on Delivery (COD), the property passes only after N -the buyer pays the requisite Cash before collecting delivery of the goods.
7. **Where goods are sent on Approval or on Sale or Return Basis**, the property in the goods is transferred only - I) when the buyer informs his approval or acceptance of the goods; II) In another case, if the buyer does not intimate his approval or acceptance of the goods, or his rejection of the same, but still retains those goods, the property passes after expiry of a reasonable time.

As long as the property in the goods is not transferred to the buyer, the goods remain at the risk of the seller. After the ownership passes to the buyer, the goods are at the Buyer's Risk, since Risk follows ownership.

Let us be clear that **Sale of Goods Act relate to sale and purchase of goods**, but the contract of sale is regulated by the Indian Contracts Act, 1872.

At the very start, we must clear our conception about the following terms - **Goods, Specific Goods, Unascertained goods, Future goods and Contingent goods.**

The immediate question coming to mind is - **What are goods?** It is clarified that **every kind of movable property** is goods but - Actionable Claims and Money are excluded. (All things attached to the earth are not movable and are therefore not goods under the Act. However, standing crops, grass and fruits on trees that can be separated are covered under the definition of movable goods).

So, the question arises - **What are Actionable Claims** ? Actionable claims are debt or a claim for money which a person may have from another person, which may be recovered by suit.

So, what is **Money** ? Money here simply means legal tender.

Specific Goods are goods that can be clearly identified and recognized

Unspecific Goods are those goods that can be indicated by description but cannot be separately identified. For example, as long as the bags of sugar, kept in a godown for sale, are not identified with any specific buyer, they remain Unspecified Goods. As soon as some bags are brought out, marked, separated and issued to a buyer, they become identifiable and become Specific goods.

Future Goods are goods which have not yet been manufactured or produced or acquired by the seller after entering into a contract of sale. For example, X agrees to sell Apples to Z that he will grow in his orchard in the coming fruit season. Such a contract is for sale of future goods.

Contingent Goods, are goods that can be sold only depending on the happening of an uncertain event, called a **Contingency**. For example, M enters into a contract to sell a particular watch to N if M manages to buy it from C - the current owner of the watch. The watch here is considered - Contingent Goods.

Now, let us revise, partly the **Negotiable Instruments Act, 1881**

To start with, let us ask ourselves a basic question - **What is a Negotiable Instrument** ?

For that we need to understand two things - 1. Meaning of "Negotiable"; and 2. Meaning of "Instrument".

Negotiable means transferable by delivery.

Instrument means a written document. Such written document creates a right in favour for some person.

The written document can be a - a Promissory note, a bill of exchange or a cheque payable either to Order or to the Bearer of such document.

Naturally, the obvious question coming to mind shall now be - **What is a Promissory Note** ? ;

A Promissory Note is not a currency note. It is an instrument (document) in writing which contains unconditional undertaking, duly signed by the maker, **who agrees to pay** a certain sum of money, only to the order of a certain person or to the bearer holding the instrument.

The person signing the instrument is called the **Maker** and the person who will get the money is called the **Payee**.

Next question is - What is a Bill of Exchange ?

A Bill of Exchange is also an instrument in writing containing an unconditional order, duly signed by the Maker, **directing a certain person to pay** a certain sum of money only to, or to the order of a certain person or to the bearer of the instrument.

The Maker of the Bill of Exchange is called the **Drawer** and the person who is directed to pay is called the **Drawee**. Here, the Payee must present the bill to the Drawee for his acceptance by signing on the bill and thereby signifying his acceptance. After Acceptance, the Drawee becomes the **Acceptor**.

The remaining question is - what is a Cheque ?

A Cheque is a Bill of Exchange drawn upon a *specified banker* and payable on demand. A cheque can be either a Bearer Cheque or an Order cheque but in both cases, it is **payable on demand**. The Specified banker, named has to pay the cheque, when it is presented to him during official banking/office hours at his office. However, the cheque must be validly drawn and the Drawee must have sufficient funds to his credit in his bank account in order to be duly honoured for payment.

Now let us know the **difference between a Promissory Note and a Bill of Exchange**.

1. In a Promissory Note, there are 2 parties - the **Maker** and the **Payee**
2. In a Bill of Exchange, there are 3 parties - The **Drawer**, the **Drawee** and the **Payee**.
3. In a Promissory Note, there is a **Promise to pay**
4. In a Bill of Exchange, there is an **Order to pay**
5. In a Promissory Note, no acceptance is required but **it has to be signed by the person liable to pay**.
6. A Bill of Exchange (barring exceptions) has to be accepted by the Drawee before it becomes binding on him.
7. **The maker of a Promissory Note is Primarily liable** on the instrument ;
8. **The Drawer of the Bill of Exchange is liable only when** the Drawee does not accept the instrument or pay the money amount due.
9. In case of a Promissory Note, the **Notice of Dishonour to the Maker is not required** but a **Notice of dishonor is required in case of a Bill of Exchange**, when there is a non-payment or non-acceptance.

So, the next question is **What is a Notice of Dishonour ?**

Please note that when there is a non-payment or non-acceptance of a Bill of Exchange, a notice has to be given to all the persons liable to pay, except the Drawee. Such a notice is called Notice of Dishonour.

At this stage, let us understand the **difference between Bill of Exchange and Cheque** :

1. A **Cheque** is a bill of exchange but it can be drawn only upon a bank.
2. A **Bill of Exchange** can be drawn upon any person including a bank. Every Bill of Exchange is not a cheque.
3. A Bill of Exchange required acceptance, except under certain circumstances. (The exceptions are - 1. The Bill of Exchange have already been protested because of non-acceptance ; and 2. The presentation of the bill is barred by obstacles caused by

superior force without human intervention such as earthquake, tornadoes, hurricane and acts of God.

4. A cheque is always payable on demand
5. A Bill of Exchange may be either payable on demand or after a period of time.
6. The acceptor of a bill of exchange is allowed 3 days of grace to make the payment, after the maturity of the bill
7. The Banker is not allowed any days of grace after being presented for payment
8. The Drawer of the bill is discharged from liability if the bill is not presented to the acceptor for payment at the due time.
9. The drawer of a cheque is discharged from liability only if he suffers damage due to delay in presenting the cheque for payment
10. A banker does not have to give a Notice of Dishonour to the drawer to make him liable to compensate the Payee, if the banker fails to pay a cheque.
11. In case of Bills of Exchange, it is necessary to give Notice of Dishonour to the drawer, *except in special cases.*
12. A cheque may be crossed but there is no provision to cross a Bill.
13. The payment of cheque may be countermanded by the Drawer. (*Countermand means - to reverse, revoke, repeal, retract, rescind, withdraw, quash, scrap, over-rule, cancel, negate an order.*)
14. The payment of a bill of Exchange cannot be countermanded.
15. A Cheque does not require any stamp
16. A Bill of Exchange must be stamped.

As said above, In case of Bills of Exchange, it is necessary to give Notice of Dishonour to the drawer, *except in special cases given below:*

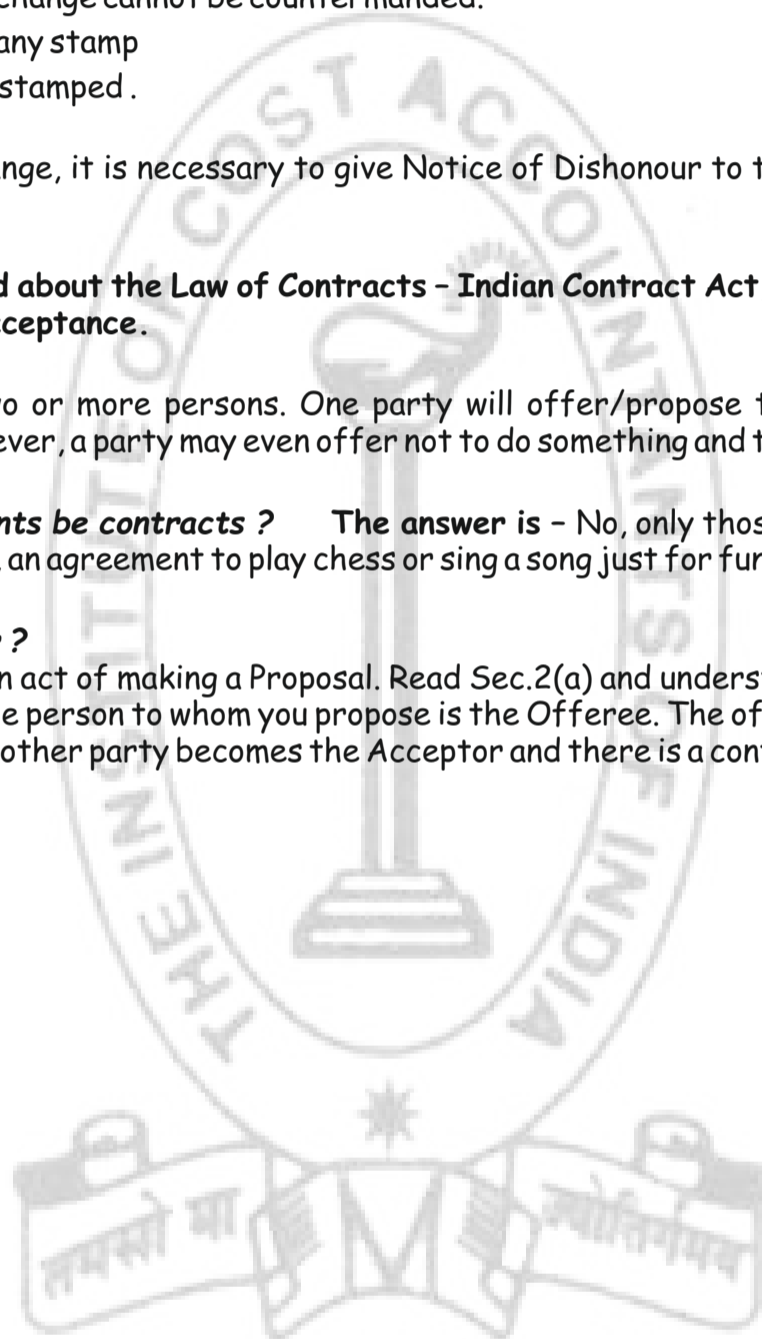
Now, let us revise partly, what we read about the Law of Contracts - Indian Contract Act, 1872
To start with, let us cover Offer and Acceptance.

In every contract, there has to be two or more persons. One party will offer/propose to do something and the other party will agree/accept the offer/proposal. However, a party may even offer not to do something and the other party may agree/accept that.

The question arises - Will all agreements be contracts ? The answer is - No, only those agreements that can be enforced in the court of law are contracts. For example, an agreement to play chess or sing a song just for fun.

So, now ask yourself - **What is an Offer ?**

The Answer is simple. An offer is just an act of making a Proposal. Read Sec.2(a) and understand that. The person making the Offer is the Offeror /Proposer/Promisee and the person to whom you propose is the Offeree. The offer has to be for a Consideration and when that is accepted by the other party, the other party becomes the Acceptor and there is a contract.



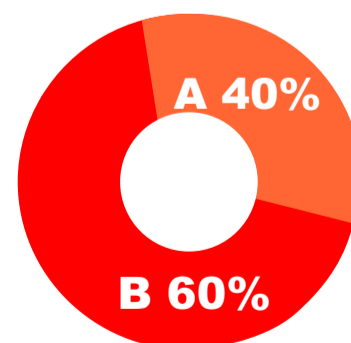


PAPER: 4

FUNDAMENTALS OF BUSINESS MATHEMATICS AND STATISTICS (FBMS)

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Your Preparation Quick Takes



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 let me discuss some numerical problems on Standard Dispersion.

Illustration1: Calculate the standard deviation of the following distribution:

Age	No of people
20-25	170
25-30	110
30-35	80
35-40	45
40-45	40
45-50	35

With such type of grouped data we could use the following formulas to calculate the variance and standard deviation:

$$\sigma^2 = \frac{\sum f(x - \mu)^2}{N} = \frac{\sum fx^2}{N} - \mu^2$$

$$\sigma = \sqrt{\sigma^2} = \sqrt{\frac{\sum f(x - \mu)^2}{N}} = \sqrt{\frac{\sum fx^2}{N} - \mu^2}$$

Where:

- σ^2 = Population variance;
- σ = population standard deviation;
- f = frequency of each of the class;
- x = class mark of each class;
- μ = population mean;
- N = size of the population;

The following table shows how to apply these equations to find the variance and standard deviation from the given grouped data.

Class	Class		(f) * (x)	Mean			
	Mark (x)	Frequency (f)		μ	$x - \mu$	$(x - \mu)^2$	$f(x - \mu)^2$
20-25	22.5	170	3825	30.20833	-7.70833	59.41840278	10101.1285
25-30	27.5	110	3025	30.20833	-2.70833	7.335069444	806.857639
30-35	32.5	80	2600	30.20833	2.291667	5.251736111	420.138889
35-40	37.5	45	1687.5	30.20833	7.291667	53.16840278	2392.57813
40-45	42.5	40	1700	30.20833	12.29167	151.0850694	6043.40278
45-50	47.5	35	1662.5	30.20833	17.29167	299.0017361	10465.0608
Total		480	14500				30229.1667

$$\mu = \frac{\Sigma(f * x)}{\Sigma f} = \frac{14500}{480} = 30.21$$

$$\sigma^2 = \frac{\Sigma f(x - \mu)^2}{N} = \frac{30229.17}{480} = 62.98$$

$$\sigma = \sqrt{\sigma^2} = \sqrt{62.98} = 7.936$$

The above method of calculating s.d. is called direct method. Instead we could use indirect method and by indirect method instead of working with actual mean μ , we do the same with an assumed mean A . A can be any value, generally the middle value of x , is taken as assumed working mean.

Let in the above illustration the assumed mean is 32.5

$$\sigma = \sqrt{\frac{\Sigma f d^2}{N} - \left(\frac{\Sigma f d}{N}\right)^2}$$

The following table shows how to apply these equations to find the standard deviation from the given grouped data.

Class	Class Mark (x)	Frequency (f)	Mean $A = 32.5$	$d = x - A$	$f d$	$f d^2$
20-25	22.5	170	32.5	-10	-1700	17000
25-30	27.5	110	32.5	-5	-550	2750
30-35	32.5	80	32.5	0	0	0
35-40	37.5	45	32.5	5	225	1125
40-45	42.5	40	32.5	10	400	4000
45-50	47.5	35	32.5	15	525	7875
Total		480			-1100	32750

$$\sigma = \sqrt{\frac{32750}{480} - \left(\frac{-1100}{480}\right)^2} = \sqrt{68.23 - 5.25} = 7.936$$

Another method of calculating standard deviation is called Step deviation method by which

$$\sigma = \sqrt{\frac{\Sigma f d'^2}{N} - \left(\frac{\Sigma f d'}{N}\right)^2} \times h$$

Where $d' = \frac{x-A}{h}$,

h is a common factor, A is the assumed average & m is the mid value of the class interval

Illustration2: Calculate the mean and standard deviation from the following data:

Value	Frequency
90-99	2
80-89	12
70-79	22
60-69	20
50-59	14
40-49	4

30-39

1

Class Limit	Class boundary	Mid value (m)	$d' = \frac{x - 64.5}{10}$	f	fd'	fd' ²
90-99	89.5-99.5	94.5	3	2	6	18
80-89	79.5-89.5	84.5	2	12	24	48
70-79	69.5-79.5	74.5	1	22	22	22
60-69	59.5-69.5	64.5	0	20	0	0
50-59	49.5-59.5	54.5	-1	14	-14	14
40-49	39.5-49.5	44.5	-2	4	-8	16
30-39	29.5-39.5	34.5	-3	1	-3	9
Total				75	27	127

In the above computation $A = 64.5, h = 10$

$$\sigma = \sqrt{\frac{\sum fd'^2}{N} - \left(\frac{\sum fd'}{N}\right)^2} \times h = \sqrt{\frac{127}{75} - \left(\frac{27}{75}\right)^2} \times 10 = \sqrt{1.6933 - 0.1296} \times 10 = 12.505$$

$$\bar{X} = A + \frac{\sum fd'}{N} \times h = 64.5 + \frac{27}{75} \times 10 = 68.1$$

Illustration3: Calculate arithmetic mean and standard deviation from the following data

Value	Frequency	Value	Frequency
More than 800	14	More than 400	381
More than 700	44	More than 300	527
More than 600	96	More than 200	615
More than 500	175	More than 100	660

The following table shows the detail computation

Value	Class	Cum Frequency	Frequency	Mid Value m	$d' = \frac{m - 450}{100}$	fd'	fd' ²
800	800-900	14	14	850	4	56	224
700	700-800	44	30	750	3	90	270
600	600-700	96	52	650	2	104	208
500	500-600	175	79	550	1	79	79
400	400-500	381	206	450	0	0	0
300	300-400	527	146	350	-1	-146	146
200	200-300	615	88	250	-2	-176	352
100	100-200	660	45	150	-3	-135	405
Total			660			-128	1684

Therefore

$$\bar{X} = A + \frac{\sum fd'}{N} \times h = 450 - \frac{128}{660} \times 100 = 430.606$$

$$\sigma = \sqrt{\frac{\sum fd'^2}{N} - \left(\frac{\sum fd'}{N}\right)^2} \times h = \sqrt{\frac{1684}{660} - \left(\frac{-128}{660}\right)^2} \times 100 = 158.55$$

Illustration4: Calculate standard deviation from the following set of observations

8	9	15	23	5	11	19	8	10	12
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These are ungrouped data. For these sort of data standard deviation is computed by the following formula -

Direct method:

$$\sigma = \sqrt{\frac{\sum(X-\bar{X})^2}{n}}, \text{ where } \bar{X} \text{ is the arithmetic mean, } n \text{ number of items.....(A)}$$

$$\text{Or, } \sigma = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} \text{.....(B)}$$

The detail computation as per formula (A) and (B) are given in the following tables

	Values X	Deviation $x = X - \bar{X}$	Deviation Squared x^2
	8	-4	16
	9	-3	9
	15	3	9
	23	11	121
	5	-7	49
	11	-1	1
	19	7	49
	8	-4	16
	10	-2	4
	12	0	0
Total	120		274
\bar{X}	12		

$$\text{So } \sigma = \sqrt{\frac{274}{10}} = 5.23.$$

	Values (X)	Square of Values (X^2)
	8	64
	9	81
	15	225
	23	529
	5	25
	11	121
	19	361
	8	64
	10	100
	12	144
Total	120	1714

$$\text{So } \sigma = \sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2} = \sqrt{\frac{1714}{10} - \left(\frac{120}{10}\right)^2} = 5.23$$

The s.d of above ungrouped data can also be found by short cut method by the following formula:

$$\sigma = \sqrt{\frac{\sum d^2}{n} - \left(\frac{\sum d}{n}\right)^2} \text{ where } d = X - A \text{ and } A \text{ is assumed mean.}$$

The detailed computation is given in the following table

Values (X)	Deviation $d = X - A$	d^2
8	-2	4
9	-1	1
15	5	25
23	13	169
5	-5	25
11	1	1
19	9	81
8	-2	4
10	0	0
12	2	4
Total	20	314

$$\text{So } \sigma = \sqrt{\frac{\sum d^2}{n} - \left(\frac{\sum d}{n}\right)^2} = \sqrt{\frac{314}{10} - \left(\frac{20}{10}\right)^2} = 5.23$$

Usually $\sigma = \sqrt{\sigma^2} = \sqrt{\frac{\sum f(x-\mu)^2}{N}}$ is the population standard deviation. For sample standard deviation we must use $s = \sqrt{s^2} = \sqrt{\frac{\sum f(x-\bar{x})^2}{n-1}}$

Where σ = population standard deviation, s = sample standard deviation, μ = population mean, \bar{x} = sample mean, N = no of items in population, n = no of items in sample

Illustration5: Profit on 180 vehicles sold last month at Maruti Kolkata dealer are as follows:

Profit (R)	Frequency
200 up to 600	8
600 up to 1000	11
1000 up to 1400	23
1400 up to 1800	38
1800 up to 2200	45
2200 up to 2600	32
2600 up to 3000	19
3000 up to 3400	4
Total	180

Determine arithmetic mean and standard deviation

$$\text{Sample mean is } \bar{x} = \frac{\sum fx}{n} \text{ \& sample standard deviation is } s = \sqrt{s^2} = \sqrt{\frac{\sum f(x-\bar{x})^2}{n-1}}$$

Detail computations are as follows:

Profit	Mid value (x)	Frequency (f)	fx	x-mean	(x-mean) ²	f(x-mean) ²
200 to 600	400	8	3200	-1451.11	2105723.457	16845787.65
600 to 1000	800	11	8800	-1051.11	1104834.568	12153180.25
1000 to 1400	1200	23	27600	-651.111	423945.679	9750750.617
1400 to 1800	1600	38	60800	-251.111	63056.79012	2396158.025
1800 to 2200	2000	45	90000	148.8889	22167.90123	997555.5556
2200 to 2600	2400	32	76800	548.8889	301279.0123	9640928.395
2600 to 3000	2800	19	53200	948.8889	900390.1235	17107412.35
3000 to 3400	3200	4	12800	1348.889	1819501.235	7278004.938
Total		180	333200			76169777.78
Mean			1851.111		S.d	652.3262104

$$\bar{x} = \frac{\Sigma fx}{n} = \frac{333200}{180} = 1851.111 \text{ \& } = \sqrt{s^2} = \sqrt{\frac{\Sigma f(x - \bar{x})^2}{n - 1}} = \sqrt{\frac{76169777.78}{180 - 1}} = 652.33$$

Illustration6: North east Netcon an internet provider in north east region developed the following frequency distribution on the age of internet users. Estimate the mean and the standard deviation

Age (years)	Frequency
10 up to 20	3
20 up to 30	7
30 up to 40	18
40 up to 50	20
50 up to 60	12
60 up to 70	5
70 up to 80	2

Sample mean is $\bar{x} = \frac{\Sigma fx}{n}$ & sample standard deviation is $s = \sqrt{s^2} = \sqrt{\frac{\Sigma f(x - \bar{x})^2}{n - 1}}$

Detail computations are as follows:

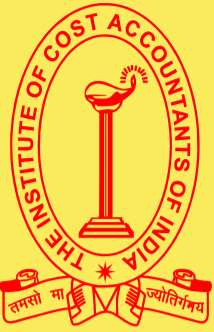
Age	Mid value (x)	Frequency (f)	fx	x-mean	(x-mean) ²	f(x-mean) ²
10 to 20	15	3	45	-28.0597	787.3468479	2362.040544
20 to 30	25	7	175	-18.0597	326.152818	2283.069726
30 to 40	35	18	630	-8.0597	64.95878815	1169.258187
40 to 50	45	20	900	1.940299	3.764758298	75.29516596
50 to 60	55	12	660	11.9403	142.5707284	1710.848741
60 to 70	65	5	325	21.9403	481.3766986	2406.883493
70 to 80	75	2	150	31.9403	1020.182669	2040.365337
Total		67	2885			12047.76119
Mean			43.0597		S.d	13.51080443

$$\bar{x} = \frac{\Sigma fx}{n} = \frac{2885}{67} = 43.0597 \text{ \& } = \sqrt{s^2} = \sqrt{\frac{\Sigma f(x - \bar{x})^2}{n - 1}} = \sqrt{\frac{12047.76119}{67 - 1}} = 13.51$$

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 discussions are held with computation of S.D with different formulas both for grouped and ungrouped data. These could be used as supplement to the study guide. Students should go thoroughly for clear conception on the subject Guide book on the paper 4- Fundamental of Business mathematics and Statistics written and issued by Institute on Syllabus -16.





PRACTICAL Advice

ABOUT YOUR STUDIES - FOUNDATION COURSE

Practical support, information and advice to help you get the most out of your studies.

START

01

Read Study Notes, MTPs, E-Bulletin, Work Books, Attend Webinar sessions

Solve Exercises given in Study Note

02

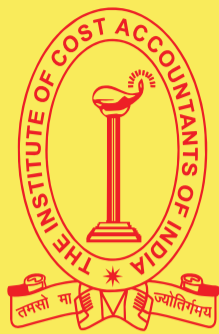
03

Assess Yourself

Appear For Examination

04

FINISHED



SUBMISSIONS



Dear Students,

We are very much delighted to receive responses from all of you; for whom our effort is!

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 excellence! One of the mails received is acknowledged below.

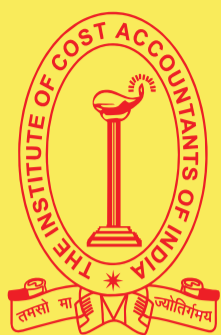
Please put your opinions so that we can make your e-bulletin everything that you want it to be.

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Dear Students,

Message from Directorate of Studies

Heartfelt wishes to you for passing the exam!! All who passed out have been sincere and diligent since day one and never failed to amaze us with your dedication. You've proved that dedication and learning end at resulting in excellent outcomes. Best wishes for achieving the best place. So proud to call you our student! Congratulations and best wishes for your life. May your future be filled with many great achievements like this.

Those who could not pass out please be steady and we believe, everyone has intellect and presence of mind. But only a few students who can deliver the right thing at right time and with right courage become the winner in the examination. So, please try to deliver your best in your next examination.

We from the Directorate of studies know your expectations from us and accordingly we are trying to deliver some meaningful tips through the publications of monthly E-bulletins. If you sincerely follow those tips, we hope, you will be successful in your endeavor.

To celebrate **75 years of independence and commemorate it as India is celebrating, 'Azadi Ka Amrut Mahotsav'**, across the country and amid the coronavirus pandemic and also organizing various events. India's freedom fighters fought a long and hard struggle for the country's independence from the British and, for years, their words have inspired us. We hope that our students will also participate and pay their homage to the freedom fighters.

Certain general guidelines are listed below and which will help you in preparing yourselves:

- Conceptual understanding & Overall understanding of the subject should be clear.
- Candidates are advised to go through the study material provided by the Institute in an analytical manner.
- Students should improve basic understanding of the subject with focus on core concepts.
- The Candidates are expected to give to the point answer, which is a basic pre-requisite for any professional examination.
- To strengthen the answers candidates are advised to give answer precisely and in a structured manner.
- In-depth knowledge about specific terms is required.
- Write question numbers correctly and prominently.
- Proper time management is also important while answering.

Please refer the link mentioned below :

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- Don't give up
- Don't give in
- Don't give out
- You can win!

The Institute is pleased to inform that the University Grants Commission (UGC) Ministry of Education, Govt. of India has announced that CMA qualification be Considered equivalent to PG Degree.

GOOD LUCK

Be Prepared and Get Success;

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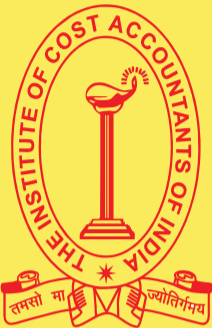
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Few Snapshots



CMA P. Raju Iyer, President, CMA Vijender Sharma, Vice President, CMA B.B. Goyal, Adviser, ICMAI MARF and CMA Kaushik Banerjee, Secretary of the Institute during a meeting with Mr. Hussain Niyazy, Auditor General of Maldives and other delegates from ICA Maldives on 9th March, 2022 at CMA Bhawan, New Delhi.



Glimpses of Seminar organised by IAASB jointly with Chandigarh-Panchkula-Mohali Chapter of the Institute on 5th March, 2022 at Chandigarh.



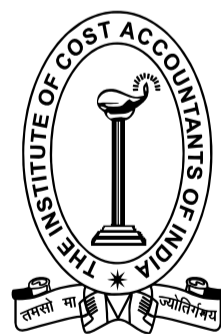
CMA P. Raju Iyer, President along with CMA Vijender Sharma, Vice President of the Institute, CMA B.B. Goyal, Former Addl. Chief Advisor (Cost), Ministry of Finance, Govt. of India called on Shri Ravi Shankar Prasad, Hon'ble Member of Parliament (Lok Sabha) & Member, Parliamentary Standing Committee on Finance on 4th March, 2022 at New Delhi.



International Women's Day celebration at CMA Bhawan, New Delhi on 8 March, 2022



CMA P. Raju Iyer, President and CMA Vijender Sharma, Vice President of the Institute receiving the 'ET Inspiring Leaders East 2022' Award Certificate of Excellence under the category 'Prime Professional Accountancy Body in India' on 6th March, 2022 at Kolkata



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