DIRECTORATE OF EDUCATION
Govt. of NCT, Delhi

SUPPORTING MATERIAL
2016 – 2017

Economics

CLASS : XI

ENGLISH MEDIUM

NOT FOR SALE

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Class - XI
Economics

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Suggested Question Paper Design
Economics (Code No. 030)
Class XI (2016-17)
March 2017 Examination

Theory: 90 Marks + Project: 10 Marks **Duration: 3hrs**

S.No	Typology of Questions	Very short Answer MCQ 1 Marks	Short Answer I 3 Marks	Short Answer II 4 Marks	long Answer 6 Marks	OTBA 5 Marks	Duration Marks	3 hrs %
1	**Remembering-** (knowledge based simple recall questions, to know specific facts, terms, theories, Identify, define, or recite, information)	-	2	1	2		22	25%
2	**Understanding-** (Comprehension - to be familiar) with meaning and to understand conceptually, interpret, compare contrast, explain, paraphrase, or interpret information)	1	2	1	2		23	25%
3	**Application** (Use abstract information in concrete situation, to apply knowledge to new situations. Use given content to interpret a situation, provide an example, or solve a problem)	2	2	1	1		18	20%
4	**Higher Order Thinking Skills** (Analysis & Synthesis- Classify, compare, contrast, or differentiate pieces of information, organize and/or integrate unique pieces of information from a variety of sources)	2	2	-	1	1	19	21%
5	**Evaluation -** (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	-	-	1	8	9%
	TOTAL	5X1=5	9X3=27	3X4=12	6X6=36	2X5=10	Theory 90+10 projects = 100 marks	100

Note: The question paper will include a section on Open Text Based Assessment (OTBA) of 10 marks from unit-6 of Part-B. From this unit, no other questions will be asked the theory examination. The OTBA examination to be held in the March 2017. the open text material on the identified unit will be supplied to students in advance. The OTBA is designed to the test the analytical and higher order thinking skills of students.

There will be internal Choice in questions of 3 marks, 4 marks and 6 marks in both sections (A and B). (Total 3 internal choices in section A and total 3 internal choices in section B)

ECONOMICS (Code No. 030)
(2016-17)

Rationale

Economics is one of the social sciences, which has great influence on every human being. As economic life and the economy go through changes, the need to ground education in children's own experience becomes essential. While doing so, it is imperative to provide them opportunities to acquire analytical skills to observe and understand the economic realities.

At senior secondary stage the learners are in a position to understand abstract ideas, exercise the power of thinking and to develop their own perception. It is at this stage, the learners are exposed to the rigour of the discipline of economics in a systematic way.

The economics courses are introduced in such a way that in the initial stage, the learners are introduced to the economics realities that the nation is facing today along with some basic statistical tools to understand these broader economics realities. In the later stage, the learners are introduced to economics as a theory of abstraction.

The economics courses also contain many projects and activities. These will provide opportunities for the learners to explore various economic issues both from their day-to-day life and from issues, which are broader and invisible in nature. The academic skills that learn in these courses help to develop the projects and activities. The syllabus is also expected to provide opportunities to use information and communication technologies to facilitate their learning process.

Objectives:

- Understanding of some basic economic concepts and development of economic reasoning which the learner can apply in their day-to-day life as citizens, workers and consumers.
- Realisation of learners' role in nation building and sensitivity to the economic issues that nation is facing today.
- Equipment with basic tools of economics and statistics to analyse economics issues. This is pertinent for even those who may not pursue this course beyond senior secondary stage.

- Development of understanding that there can be more than one view on any economic issue and necessary skills to argue logically with reasoning.

ECONOMICS
CLASS - XI (2016-17)

Paper 1 **3 Hours**
90 Marks

Units	Statistics for Economics	Marks	Periods
Part A	1. Introduction	13	7
	2. Collection, Oragnisation and Presentation of Data		27
	3. Statistical Tools and Interpretation	27	66
		40	100
Part B	**India Economic Development**		34
	4. Development Experience (1947-90) and Economic Reforms since 1991	18	
	5.Current Challenges facing Indian Economy	22	60
	6. Development Experience of India - A Comparison with Neighbours (OTBA)	10	14
	Theory Paper (40 + 50 = 90 Marks)	50	108
Part C	**Project work**	10	12

Note: The question paper will include a section on Open Text Based Assessment (OTBA) of 10 marks from unit-6 of Part-B. From this unit, no other questions will be asked in the theory examination. The OTBA examination to be held in the March 2017. the open text material on the identified unit will be supplied to students in advance. The OTBA is designed to the test the analytical and higher order thinking skills of students.

Part A: Statistics for Economics

In this course, the learners are expected to acquire skills in collection, organisation and presentation or quantitative and qualitative information pertaining to various simple economics aspects systematically. It also intends to provide some basic statistical to analyse and interpret any economic information and draw appropriate inferences. In this process, the learners are also expected to understand the behaviour of various economic data.

Unit 1: Introduction

What is Economics ?

Meaning, scope and importance of statistics in Economics

Unit 2: Collection, Oragnisation and Presentation of data

Collection of data - Sources of data - Primary and secondary: how basic data is collected with concepts of sampling; methods of collecting data; some important sources of secondary data: Census of India and National Sample Survey Organisation.

Oraganisation of data : Meaning and types of variable; Frequency Distribution.

Presentation of Data: Tabular Presentation and Diagrammatic Presentation of Data: (i) Geomatric forms (bar diagrams and pie diagrams), (ii) Frequency diagrams (histogram, polygon and ogive) and (iii) Arithmetic line graphs (time series graph).

Unit 3: Statistical Tools and Interpretation

(For all the numerical Problems and solutions, the appropriate economic interpretation may be attempted. This means, the students need to solve the problems and provide interpretation for the results derived)

Measures of Central Tendency - mean (simple and weighted) median and mode

Measures of Dispersion - absolute dispersion (range, quartile deviation, mean deviation and standard deviation); relative dispersion (co-effiiciennt range, co-efficient of quartile-deviation.

co-efficient of mean deviation, co-efficient of variation); Lorenz Curve: Meaning, construction and its application.

Correlation - meaning, scatter diagram: Measures of Correlation - Kari Person's method (two variables ungrouped data) Spearmean's rank corretation.

Introduction to Index Numbers - meaning, types, wholesale price index, consumer price index and index of industrial production, Users of index numbers.

Part B: Indian Economic Development

Unit 4: Development Experience (1947-90) and Economic Reforms since 1991: 34 Periods

A brief introduction of the state of Indian economy on the eve

of independence. Common goals of Five Year Plans.

Main features, problems and policies of agriculture (Institutional aspects and new agricultural strategy, etc.) industry licensing, etc.) and foreign trade.

Economic Reforms since 1991:

Need and main features - liberalisation, globalisation and privalisation;

An appraisal of LPG policies

Unit 5: Current challenges facing Indian Economy 60 Periods

Poverty- absolute and relative; Main Programmes for poverty allevation: A critical assessment ;

Rural development: Key issues - credit and marketing - role of cooperative; agricultural diversification; alternative farming - organic farming

Human Capital Formation: How people become resource; Role of human capital in economic development; Growth of Education Sector in India.

Employment : Formal and informal, growth and other issues: Problems and policies.

Inflation : Problems and policies.

Infrastructure : Meaning and Types: Case studies: Energy and Health: Problems and Policies. A critical assessment;

Sustainable Economic Development : Meaning Effects of Economic Development on Resources and Environment, including global Warming.

Unit 6: Development Experience of India; (OTBA) 14 Periods

A comparison with neighbours

India and Pakistan

India and China

Issues: growth, population, sectoral development and other development indicators.

Part C: Developing Projects in Economics

The students may be encouraged to develop as per the suggested project guidelines. Case studies of a few

organisations / outlets may also be encouraged. Under this the students will do only one comprehensive project using concepts from both part A and part B.

Some of the examples of the projects are as follows (they are not mandatory but suggestive):

(i) A report on demographic structure of your neighbourhood.

(ii) Changing consumer awareness amongst households.

(iii) Dissemination of price information for growers and its impact on consumers.

(iv) Study of a cooperative institutions: milk cooperatives, marketing cooperatives etc.

(v) Case students on public private partnership, outsourcing and outward foreign Direct investment

(vi) Global warming

(vii) Designing eco-friendly projects in school such as paper convert recycle.

The idea behind introducing this unit is to enable the students to develop the ways and means by which a projects can be developed using the skills learned in the course this includes all the steps involved in designing a project starting from choosing a title. exploring the information relating to the title, collection of primary and secondary data, analysing the data presentation of the projects and using various statistical tools and their interpretation and conclusion.

Unit - I
Introduction

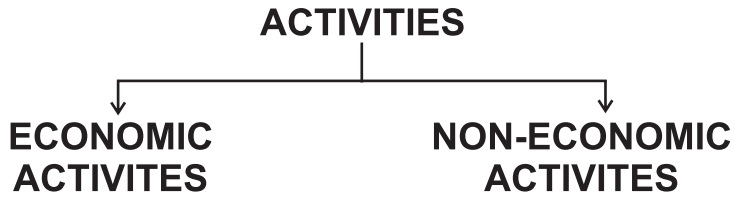
Economics is the study of how people and society choose to employ scarce resources that could have alternative uses in order to produce various commodies that satisfy their wants and to distribute them for consumption among various person and groups in society.

CONSUMER – A consumer is one who consumes goods and services for the satisfaction of his wants.

PRODUCER – A person is one who produces goods and services for the generation of income.

SERVICE PRODUCER – A service provider is a person who provide some kind of service to other for a payment.

SERVICE HOLDER – A service holder is a person who work for some other person and get paid for it in the form of wages or salary.



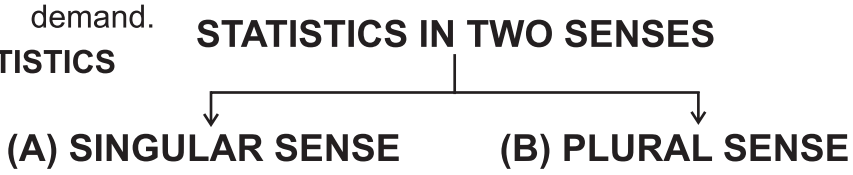
ECONOMIC ACTIVITIES – It refers to those activities which are undertaken to earn a Living for example. worker working in a factory.

NON-ECONOMIC ACTIVITIES – Activities which are not concerned with creation of money or wealth are known as Non - economic activities for example a teacher teaching his own son.

- **MAIN ECONOMIC ACTIVITIES**
  1. Consumption
  2. Production
  3. Distribution

SCARCITY – It refers to the limitation of supply in relation to demand.

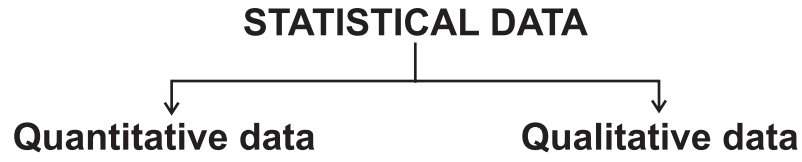
STATISTICS



Singular Sense – In singular sense, statistics deal with the collection, Presentation, analysis and interpretation of the quantitative information.

PLURAL SENSE – It means a collection of numerical fasts.

Marks of students	–	Beauty
Heights of people	–	Honesty



- **FUNCTION OF STATISTICS**

1) To simplify complex facts
2) To present facts in definite form
3) To facilitate policy formulation
4) To help in forcasting
5. To make comparison of facts
6. To enlarge individual knowledge and experience

- **IMPORTANCE OF STATISTICS IN ECONOMICS.**

1. Every branch of economics takes support from statistics in order to prove various economics theories in it.
2. Helps in understanding and solving an economics problem.
3. Studies of market structure.
4. Helps in establishing mathematical relation.
5. Useful to study behaviour of different economic concept.

- **SCOPE OF STATISTICS**

Today the importance of statistics is increasing day by day. Not a single area is visible where statistics is not in use.

a) Government
b) Business
c) Natural Science
d) Research etc.

So, that we can say every field of study is related to statistics more or less.

- **LIMITATIONS OF STATISTICS**

1. Statistics deals only with quantitative data
2. Statistics deals with aggregate of facts and not with individual facts.
3. Statistical results are true on an average.
4. Only experts can make the best possible use of statistics.
5. Data should be uniform and homogeneous.
6. Statistics can be misused.

- **ONE MARKS QUESTIONS**

1. Define consumer.
2. Who is a producer.
3. Define economy.
4. What is scarcity.
5. What is consumption.
6. What is economic activity
7. Define non-economic activity.

- **3/4 MARKS QUESTIONS**

1. Describe the importance of statistics in economics.
2. Define statistics as a singular and plural noun.
3. Explain the scope of statistics.
4. State any three limitations of statistics.
5. Distinguish between quantitative and qualitative data.
6. State any three function of statistics.
7. Find out (a) quantitative data (b) Qualitative data from the following:
   (a) Wages of employee
   (b) Expenditure of family
   (c) Honesty
8. Consumption, Production distribution are economic activities, explain ?

- **ONE MARK ANSWER**

1. Consumer is an economic agent who buys the goods and serve us to satisfy his wants.

2. Producer is one who produces goods and services for the generation of income.
3. It refers to a system which provides means to work.
4. It refers to shortage of resones in relation to their demand.
5. It is process in which people uses goods.
6. It refers to those activities which are associated to earn money.
7. It refers to those activities which are not related to earn money.

Frequently Asked Questions
INTRODUCTION

Q.1. What is the importance of statistics in economics ?

Ans. A number of economic problems can easily be understood by the use of statistics. It helps in formulation of economic policies e.g., basic economic activities like production, consumption etc. use statistics. The importance of statistics in various parts of economics as follows:

a) Statistics in consumption : To obtain the knowledge of how different groups of people spend their income from statistics relating to consumption. The data of consumption are useful and helpful in planning their budget and improve their standard of living.

b) Statistics in production : The comparative study of the production process in done with the help of statistics. The statistics of production are very useful and helpful for adjustment of demand and supply and determining quantity of production of the commodity.

(c) Statistic in distribution : Statistical methods are used in solving the problem of distribution of national income among various factors of production i.e, land, labour, capital and entrepreneur.

Q.2. Explain functions statistics ?

Ans. Statistics performs very important functions, these are :

1. Helps in Understanding Economic problem : Statistics in an indispensable tools for an economics that helps to understand an economic problem. Using its various methods, effort is made to find the causes behind it with the help of the quantitative facts of the economics problem.
2. Presentation of facts in definite form : Statistics enables an economist to present economic facts in a precise and definite form that helps in proper comprehension of what is stated. When economic facts are expressed in statistical terms, they become exact. Exact facts are more convincing than vague statement.
3. Statistics help in condensing mass data in to few numerical

measures : the numerical measures help to summarise data. For example, it would be impossible for us to remember the income of all the people in a data. it the number of people is very large. Yet one can remember easily a summary figure like the average income that obtains statistically. In this way statistics summarises and presents meaningful overall information about a mass of data.

4. Establishes relation between factors : Statistics is used in finding relationships between different economics factors. An economist may be interested in finding out, what happens to the demand for a commodity when its price increases or decreases ? Such questions can only be answered if any relationships exist or not can be easily verified by applying statistical methods.
5. Helps in formulation of plans and policies : statistical methods, help formulate appropriate economics policies and plans that solve economics problem.

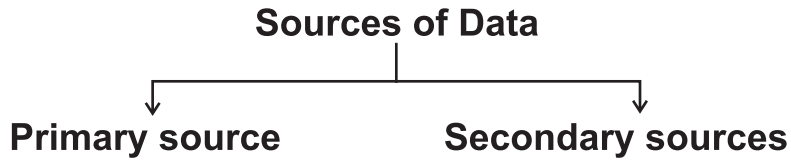
Q.3. Explain limitations of statistics ?

Ans. Statistics has some limitations, these are

1. Statistics does not study individuals : Study of an individual in not a part of subject matter of statistics, Statistics studies the aggregate of facts only.
2. Statistics deals with quantitative facts only : Statistics are numerically expressed. Statistics does not study qualitative aspects. It can be used for measured quantitative data only.
3. Statistical laws one true only on Averages : Statistical laws are not exact like the laws of physics, chemistry etc. Statistical results are true only on an average.
4. Only experts can make the best possible use of statistics : Statistics can be used by experts only. It requires special knowledge to use statistical tools otherwise results may be wrong.
5. Uniformity and Homogeneity of Data : It is essential that data must have the quality of uniformity and homogeneity to make data comparable.

Unit - 2
Collection of Data

- Data is a tool which helps in reaching a sound conclusion by providing information therefore for statistical investigation, collection of data is the first and foremost.



- **Primary Data –** Data originally collected in the process of investigation are known as primary data. It is first hand data.
- Methods of collecting primary data :–
  - i) Personal Interviews
  - ii) Mailing (Questionnaire Surveys)
  - iii) Telephone Interviews
- **Secondary Data :-** Secondary data which have been collected for some other purpose by some other agency are called secondary data.
- **Sources of secondary data :-**
  - 1) Published sources
  - 2) Unpublished sources
  - 3) Other sources – Web site
- Important points to be kept in mind while drafting the questionnaire.
  - 1) Introduction and purpose of investigation.
  - 2) Reasonable number of questions.
  - 3) Questions should be arranged logically.
  - 4) Questions should be small and clear.
  - 5) Questions should be relevant to the investigation.
  - 6) Personal questions should be avoided.
  - 7) Avoid questions of calculation.

Methods of sampling

Random Sampling
(a) Simple or unrestricted random sampling
(b) Restricted random sampling
(c) Statified
(d) Systematic
(e) Multistage Sampling

Non-Random Sampling
a) judgement sampling
b) Quota sampling
c) Convenience sampling

- Census Survey : - In this method every element of population is included in this investigation.
- **Sample Survey :-** In this method a group of units representing all the units of population is investigated.
- **Sampling Errors :-** Sampling error is the difference between the result of studying a sample and the result of the census of the whole population.
- **Non-Sampling Errors :-** It can occur in any type of survey wheather it be a census or sample survey.

Sampling Errors
1. Biased Errors
2. Unbiased Errors

Non-Sampling Error
1. Error in data acquisition
2. Non-Response Error
3. Measurement Error

Census of India and National sample survey organisation (NSSO)

- The census of India provide the most complete and continuous demographic record of population.
- The NSSO was established by the Govt. of India to conduct nation wide survey on socio -economic issues like employment diteracy, maternity, child care, utlisation of public distribution system etc.
- The data collected by NSSO survey are released through reports and its quarterly journal 'sarvekshana'.
- **One mark questions :-**
    1) What do you mean by data ?
    2) Give the meaning of primary data ?
    3) What do you mean by secondary data ?
    4) Write the meaning of population in statistics ?

5) Define sample ?

6) Expand NSSO ?

7) What is sampling error ?

8) What are non-sampling errors ?

9) Suppose there are 10 students in a class. Only three students to be selected out of them. How many samples are possible ?

10) Who presents the census related data ?

- **3/4 Marks questions**

1) Differentiate between primary and secondary data ?

2) Differentiate between census and sample ?

3) Distinguish between sampling and non sampling error ?

4) Discuss the stratified sampling with an example ?

5) Write two merits and two demerits of census method ?

6) Mention four demerits of sample method ?

7) What do you mean by random sampling ?

8) What is pilot survey ? Explain its importance ?

9) What are the essentials of a sample ?

10) Census of India is the main source of secondary data. Explain .

- **6 Marks questions:**

1) Write the essential characteristics of a good question naire ?

2) What precautions should be taken while using secondary data ?

3) Do samples provide better results than surveys ? Give reasons for your answer ?

4) What is NSSO ? Write its functions ?

5) Write the merits and demerits of personal Interview method and question naire method of collecting of data ?

- Answer of one mark questions :

1) Data is a tool which helps in reaching a sound conclusion by providing information therefore.

2) Primary data are original data which are collected by investigator himself or by enumerators deployed by the investigator for specified purpose.

3) Secondary data which have been collected for some other purpose by some other agency are called secondary data.

4) In statistics population or universe simply refers to an aggregate of items to be studied for an investigation.

5) A group of items taken from the population for investigation and representative of all the items.

6) National sample survey organisation .

7) Sampling Error is the difference between the result of studying a sample and the result of the census of the whole population.

8) It can occur in any type of survey whether it be a census or sample survey.

9) $$\frac{\text{Total Population}}{\text{No. of sample} \times (\text{Total Population} - \text{no of sample})}$$

$$\frac{10\,!}{3\,! \times (10-3)\,!} = \frac{10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{3 \times 2 \times 1 \times (7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1)} = 120$$

10) Census of India.

Frequently Asked Questions
COLLECTION OF DATA

Q.1. Explain difference between primary and secondary data ?

Ans. 1) Data collected by the investigator for his own purpose for the first time are called primary data.

2) These are original as these are collected from the source of origin.

3) These are costlier in terms of time, money and efforts involved.

4) Example : Investigator makes a list of marks obtained by students in economics of class XI by interrogating them.

- **Secondary Data**

1) Data which are already in existence and which have been collected for some other purpose are called secondary data.

2) These are not original as these are already in existence. These can be obtained from published or from any other sources.

3) These are less costlier in terms of time, money and efforts involved.

4) Example : Investigator collects the marks obtained by class teacher in economics of class XI from his school records like award list, result register etc.

Q.2. What is personal interviews to collect and demerits ?

Ans. Personal Interviews : This method is used when the researcher has access to all the members. The researcher conducts face to face interviews with the respondents. The interviewer has the opportunity of explaining the study and answering any query of respondents.

- **Merits :**

1) Collect highest response rate by this method.

2) Misinterpretation and misunderstanding can be avoided

3) Watching the reactions of respondents can provide supplementary information.

4) Allows classification of ambiguous questions.

- **Demerits :**
  1) It is expensive
  2) It requires trained interviews
  3) It takes longer time to complete the survey.
  4) Presence of the researcher may inhibit respondents from saying what they really think.

Q.6. Differentiate between census and sample method ?

Difference between census method and sample method

Census Method :

1) Census covers every individual/unit belonging to the population.
2) Since all items are studied under census method, highest degree of accuracy is possible.
3) As all items are studied under census method, this method is very expensive and involves a lot of money and efforts.
4) Census method is very time consuming as all items are studied.
5) Census method is suitable when items in the universe have diverse characteristics.
6) This method is suitable when the area under investigation is relatively small.

- **Sample Method :**
  1) Sample is a smaller group selected from the population from which the relevant information would be sought.
  2) Since only representative samples are studied under sample method. It is less accurate. However errors can be easily detected and removed.
  3) As only few samples are studied under sample method, this method is comparatively less expensive.
  4) Sample method is less time consuming as only samples are studied.
  5) Sample method is suitable when items in the universe are homogeneous.
  6) This method is suitable when the area under investigation is large.

ORGANISATION OF DATA

Key points :

- Organisation of data refers to the systematic arrangement of figures (raw data) in such a form that comparison of masses of similar data may be faciliated and further analysis may be possible.
- Classification is the process of arranging data into sequences and groups according to their common characteristics of separating them into different but related parts.
- **Characteristics of classification :-**
  1) Homogeneity
  2) Clearity
  3) Flexibility
  4) Diversification
  5) Elasticity
  6) Suitability
- **Basis of classification :**
  1) **Chronological classifications :-** The data are classified either in ascending or in descending order with reference to time such as years, quarters, months, weeks etc.
  2) **Spatial classification :-** The data are classified with reference of geographical location such as countries, states, cities, districts etc.
  3) **Qualititative classification :-** The data are classified with reference to descriptive characteristics like sex, caste, religion, literacy etc.
  4) **Quantative classification :-** The data are classified on the basis of some measurable characteristics such as height, age, weight, income, marks of students etc.
  5) **Veriable :-** Veriable is a chracteristic which is capable of being measured and capable of change in its value from time to time.

Two types of variables

  a) **Discrete variables :-** Those variables that increase in jumps or in complete numbers and are not fractional.

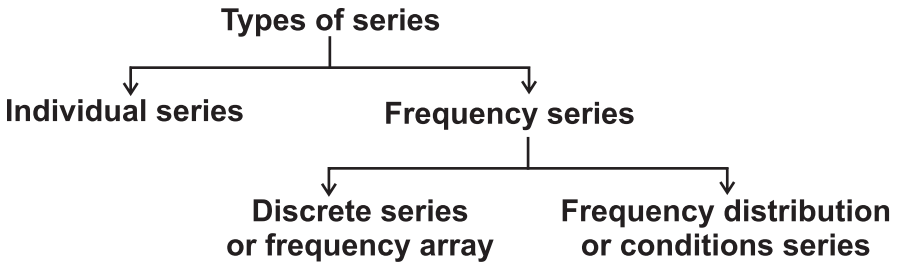
b) **Continous variables :-** Those variables that one in units of measurement which can be broken down into infinite gradations. They are capable of manifesting every conceivable fractional value with the range of possibilities.

- **Frequency distribution :-** The distribution of observations over the several values is called frequency distribution.
- **Class :-** It is a decided group of magnitudes, eg. 0-10, 10-20, 20-30 etc.
- **Class interval :-** The magnitude spread between the lower and upper class limits is called interval. for example 10-20, 10 is the lower limit and 20 is the upper limit and class interval is upper limit - lower limit, 20-10 = 10

- **Class frequency :-** The number of values in each of the quantitative classes is called the class frequency.
- **Mid-point :-** The mid-value which lies half way between the lower and upper class limits is known as mid-point.

$$\frac{10+20}{2} = 15$$

- The classes, by the exclusive method are formed in such a way that the upper class limit of one class equals the lower class limit of the next class eg 0-10, 10-20.
- In comparision to the exclusive method, the inclusive method does not excludes the upper class, limit in a class interval. It includes the upper class in a class. Thus both class. Thus both class limits are parts of the class intervals eg. 0-9, 10-19.
- The classification of data as a frequency distribution has an innerent short coming, while it summarises the raw data making it concise and comprehensible. It does not show the details that are found in raw data. So there is a loss of information in classifying raw data.



- Individual series :- Individual series are those series in which items

are listed singly. For example :-

Roll No.	Marks
1	18
2	95
3	82
4	59
5	92

- Discrete series (Frequency array) :- That series in which data are prescribed in away that exact measurements of items are clearly shown. for example :

Size of household	No. of household
1	15
2	10
3	20
4	30
5	15
6	10

- Continuous series :- It is that series in which items cannot be exactly measured. The items assume a range of values and are placed within the range of limits. for example

Marks	Frequency
0-10	5
10-20	7
20-30	10
30-40	8

- 1 Marks Questions :-
  1) State the meaning of classification ?
  2) State the meaning of qualitative classification ?
  3) What is variable ?
  4) Give the meaning of mid-value ?
  5) Define discrete series or frequency array ?
  6) Define class-interval ?
  7) What is the meant by exclusive series ?
  8) What is meant by frequency ?
  9) Define class?
  10) What do you meant by continuous veriable ?

3/4 Mark Questions :

1) State the objectives of classification ?
2) Write the characteristics of a good classification ?

3) Difference between discrete and continuous variables ?
4) Write two advantages of classification ?
5) Marks of 10 students are given below, Arrange them into ascending order and descending order.
48, 50, 35, 40, 60, 55, 25, 75, 45, 65
6) By using exclusive method and inclusive method make a frequency distribution form following data :-
33, 10, 17, 15, 20, 12, 18, 16, 20, 22, 29, 29, 23, 24, 16, 11, 16, 19, 24, 30, 29, 18, 42, 26, 32, 14, 40, 20, 23, 27, 30, 12, 15, 18, 24, 36, 18, 48, 21, 28

6 Marks Questions :-

1) Explain the types of classification of data ?
2) Define statistical series ? How many types these are ?
3) What is loss of information in classified data ?
4) Do you agree that classified data is better than raw data ? why ?

Answer of 1 mark questions :

1) Classification is the grouping of related facts into different classes.
2) The classification according to qualities or attributes of the data are called qualitative classification.
3) Variable is a characteristic which is capable of being measured and capable of change in its value from time to time.
4) It lies halfway between the lower class limit and the upper class limit of a class.
5) A discrete series or frequency array is that series in which data are presented in a way that exact measurment of items are clearly shown.
6) The magnitude spread between the lower and upper class limit is called class interval.
7) When the class intervals are so fixed that the upper limit of one class interval is the lower limit of the next class interval it is called an exclusive series.
8) Frequency is number of times an item repeats itself in the series.
9) It is a decided group of magnitudes.
10) Continuous variables are those variables that one in units of measerment which can be broken down into infinite gradations. They are capable of manifesting every conceivable fractional value with the range of possibilities.

Frequently Asked Questions
Organisation of Data

Q.7. Discuss the different methods of classification of data ?

Ans. The raw data is classified in various ways depending on the purpose.

1) Chronological Classification :- In such a classification data are classified either in ascending or in descending order with reference to time such as years, quarters, months, weeks etc.

2) Spatial Classification :- The data are classified with reference to geographical locations such as countries, states, cities, districts etc.

3) Qualitative classifications Characteristics like nationality, literacy, religion, gender, marital status etc. are called qualities or attributes. They can not be measured. Yet these attributes can be classified on the basis of either the presence or the absence of a qualitative classification.

4) Quantitative classification :- Characteristics like height, weight, age, income, makers of students etc, are quantitative in nature. When the collected data of such characteristics are grouped into classes. It becomes a quantitative classification.

Q.8. Explain characteristics of classification ?

Ans. The main characteristics of classification are :

1) Homogenity : The data classified in one group or class should be homogeneous all items in a group must be similar to each other.

2) Clarity : Classification should be done in such a way that meaningful conclusion is possible. Each item of the data should belong to one particular class only. There should be no confusion about the group or class of a given item.

3) Flexibility : Classification should be flexible and should able to adapt to new condition of the given enquiry. Some of the classes may have to be abandoned and new classes need to be added.

4) Diversification : Classification should be done in such a

way that every items of study can be classified into class. If al items are not included in the classes arrangement of data will not be correct.

5) **Suitable to objectives of study :** The basis selected for classification should be in accordance with the objectives of the statistical study. If basis selected for classification do not match the requirement, the entire exercise of investigation will be meaningless.

Q.9. Construct a discrete frequency series the help of following data by arranging in ascending order.

Marks

6	6	5	7	9	8	7	4	8	4
6	5	7	5	9	7	8	5	6	5

Ans.

Marks	Tally-bars	Frequency
4	II	2
5	𝍸	5
6	IIII	4
7	IIII	4
8	III	3
9	II	2
Total		**20**

PRESENTATION OF DATA

Data are generally voluminous; they need to be put in a compact and presentable form. There are generally two forms of presentation of data:

1. Tabular presentation
2. Diagrammatic presentation

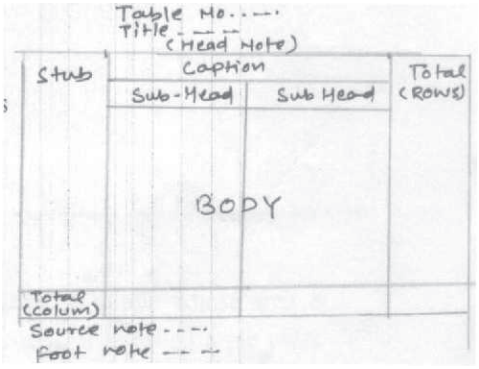
Tabular Presentation of Data:

In a tabular presentation, data are presented in rows (horizontally) and columns (vertically). The most important advantage of tabulation is that it organises data for further statistical treatment and decision making.

To construct a table it is important to learn first what the parts of a good statistical table are. When put together in a systematically ordered manner these parts form a table. The simplest way of conceptualising a table may be data presented in rows and columns along with some explanatory notes.

Tabulation can be done using one-way, two-way or three-way classification depending upon the number of characteristics involved. A good table should essentially have the following:

i. Table Number
ii. Title
iii. Captions or Column Headings
iv. Stubs or Row Headings
v. Body of the Table
vi. Unit of Measurement
vii. Source Note
viii. Footnote



Diagrammatic Presentation of Data

This method provides the quickest understanding of the actual situation to be explained by data in comparison to tabular or textual presentations. Diagrammatic presentation of data translates quite effectively the highly abstract ideas contained in numbers into more concrete and easily comprehensible form.

Diagrams may be more or less accurate but are much more effective than tables in presenting the data. There are various kinds of diagrams in common use. Amongst them the important ones are the following:

i. Geometric diagram

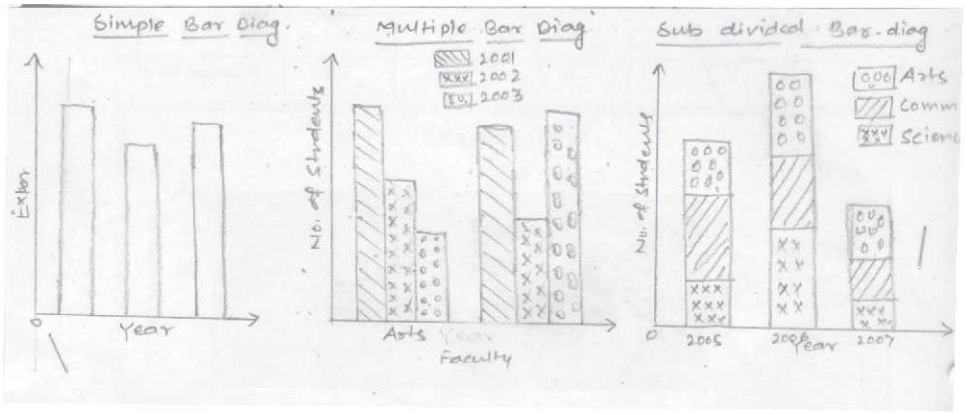
ii. Frequency diagram

iii. Arithmetic line graph

Geometric Diagram:

Bar diagram and pie diagram come in the category of geometric diagram for presentation of data.

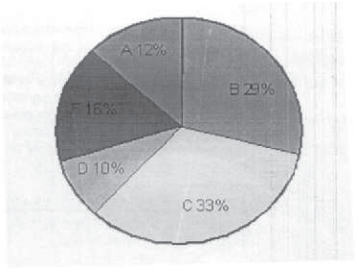
- **Bar diagram:** Bar diagram comprises a group of rectangular bars for each category of data. Height or length of the bar reads the magnitude of data. Bars of a bar diagram can be visually compared by their relative height and accordingly data are comprehended quickly.



- **Pie Diagrams:** A pie diagram is a component diagram. A circle whose area is proportionally divided among the components it represents. It is called a pie chart. Also called circle diagram, circle graph, pizza chart, or sector graph. The circle is divided into as many parts as there are components by drawing straight lines from the center to the circumference.

1. Pie charts usually are not drawn with absolute values of a category. The values of each category are firs expressed as percentage of the total value of all the categories.
2. A circle in a pie chart, irrespective of its value of radius, is thought of having 100 equal parts of 3.6° (360°/100) each. To find out the angle, the component shall subtend at the center of the circle, each percentage figure of every component is multiplied by 3.6°.
3. It may be interesting to note that data represented by a component can be represented equally well by a pie chart, the only

requirement being that absolute values of the components have to be converted into percentages before they can be used for a pie diagram.

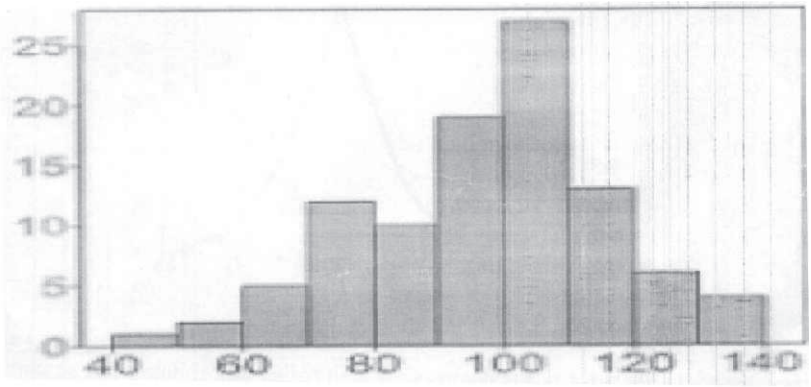


Frequency Diagram

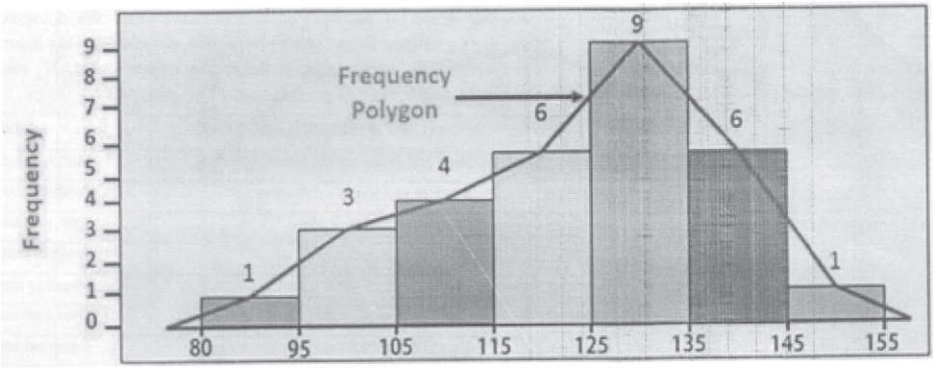
Data in the form of grouped frequency distributions are generally represented by frequency diagrams like histogram, polygon, and ogive.

- Histogram: A histogram is a two dimensional diagram. It is a set of rectangles with bases as the intervals between class interval (along X-axis) and with areas proportional to the class frequency.
- For graphical representation of such data, height for area of a rectangle is the quotient of height (here frequency) and base (here width of the class interval).
- A histogram is never drawn for a discrete variable/data
- If the classes are not continuous they are first converted into continuous classes.
- A histogram looks similar to a bar diagram. But there are more differences than similarities between the two than it may appear at the first impression.
- Moreover, in histogram no space is left in between two rectangles, but in a bar diagram some space must be left between consecutive.
- Although the bars have the same width, the width of a bar is unimportant for the purpose of comparison. The width in a histogram is as important as its height.
- We can have a bar diagram both for discrete and continuous variables, but histogram is drawn only for a continuous variable. Histogram also gives value of mode of the frequency distribution

graphically.

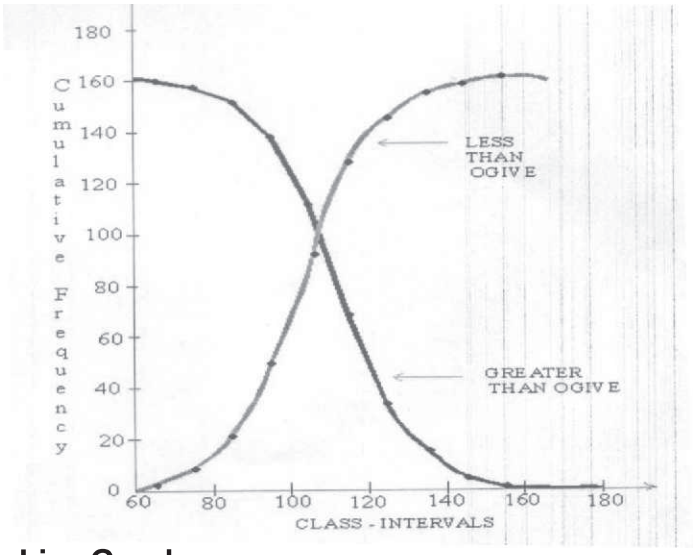


- **Polygon :** A frequency polygon is a plane bounded by straight lines, usually four or more lines. Frequency polygon is an alternative to histogram and is also derived from histogram itself. A frequency polygon can be fitted to a histogram for studying the shape of the curve. The simplest method of drawing a frequency polygon is to join the midpoints of the topside of the consecutive rectangles of the histogram.



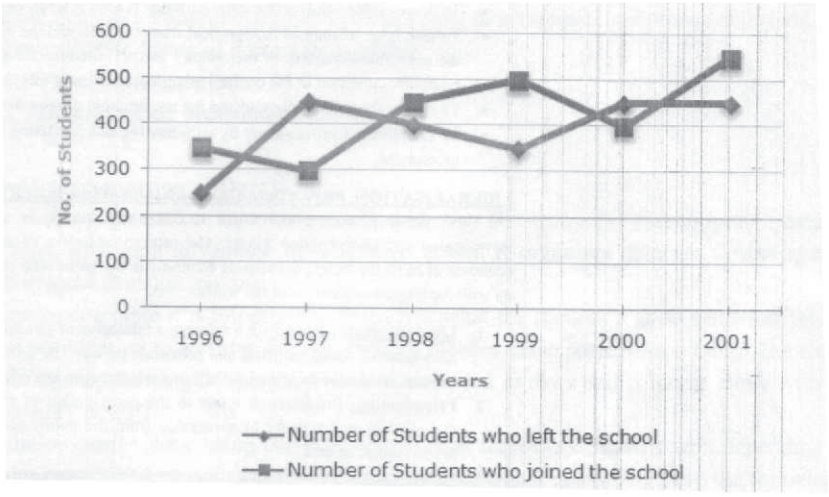
- **Ogive:** Ogive is also called cumulative frequency curve. As there are two types of cumulative frequencies, for example less than type and more than type, accordingly there are two ogives for any grouped frequency distribution data. Here in place of simple frequencies as in the case of frequency polygon, cumulative frequencies are plotted along y-axis against class limits of the frequency distribution. For less than ogive the cumulative frequencies are plotted against the respective upper limits of the class intervals whereas for more than ogives the cumulative frequencies are plotted against the respective lower limits of the

class interval. An interesting feature of the two ogives together is that their intersection point gives the median.



Arithmetic Line Graph

An arithmetic line graph is also called time series graph and is a method of diagrammatic presentation of data. In it, time (hour, day/date, week, month, year, etc.) is plotted along x-axis and the value of the variable (time series data) along y-axis. A line graph by joining these plotted points, thus, obtained is called arithmetic' line graph (time series graph). It help's in understanding the trend, periodicity, etc. in a long term time series data.



- **One Mark Questions :**

1. What is meant by tabulation .
2. Define caption as a part of table.
3. What is meant by manifold table ?
4. Define bar diagrams.
5. State the meaning of sub-divided bar diagrams.
6. Define pie-diagram.
7. What is meant by histogram ?
8. State the meaning of frequency curve.
9. Write the name of the curve which is formed by joining mid point of the top of all rectangles in histogram.
10. Define the ogive curve.
11. What is meant by false base line.

3/4 Marks Questions :

1. State three features of a good table.
2. State the merits of tabular presentation
3. Define pie-diagram. Write the steps of making pie-diagram.
4. State any three differences between tabulation and diagrammatic presentation.
5. Present the following data by multiple bar diagram. No. of students

Year	XI A	XI B	XI C
2007	40	80	130
2008	80	100	120
2009	100	120	180

6. Present the following data of final consumption expenditure of family with the help of a pie-diagram.

Items	Expenditure (in rupees)
Cloths	1600
Food	2400
Education	1000
Electricity	1500
Others	2500

7. Make a diagram from following data :

Marks	No. of students
0-9	4
10-19	17
20-29	25
30-39	32
40-49	13
50-59	6

8. Present the following data in a pie-diagram.

Items	% expenditure
Labour	25
Bricks	15
Steel	20
Cement	15
Timber	10
Supervison	15

3/6 Marks Questions

1. Explain the main parts of a table ?
2. Explain the precautions while constructing of an ideal table ?
3. Draw ogive curve class than and more than with the help of following data .

Marks	No. of students
0-10	20
10-20	14
20-30	24
30-40	26
40-50	28
50-60	38
60-70	40
70-80	10
80-90	5
90-100	5

4. Make a frequency polygon or frequency curve.

Marks	No. of students
30-35	10
35-40	12
40-45	20
40-45	26
45-50	20
50-55	38
55-60	28
60-65	18
65-70	12

Answer of one marks questions :

1. The method of arranging data orderly in form of rows and columns is known as tabulation.
2. Caption is the title given to the columns of a table. It indicates information contained in the columns.
3. Manifold table shows more than three characteristics of the data.
4. Bar diagrams are those diagrams in which data are presented in the form of bars and rectangles.
5. Sub divided bar diagrams are those diagrams in which more than one data are presented simultaneously, total values and parts there in set of data.
6. Pie diagram is a circle divided into various segement showing the percent value of a series.
7. Histogram is a graphical presentation of a frequency distribution of a continuous series.
8. Frequency curve is obtained by joining the points of a frequency polygon through freehand smoothed curves not by straight lines.
9. Frequency polygon.
10. It is the curve which is constructed by plotting cumulative frequency data on the graph paper in a form of a smooth curve.
11. when there is a large gap between zero and minimum value of a variable than to minimise this gap we use false base line.

Unit - 2
MEASURES OF CENTRAL TENDENCY

Important points

- A central tendency is a single figure that represents the whole mass of data.
- Arithmetic mean is the number which is obtained by adding the values of all the items of a series and dividing the total by the number of items.
- When all items of a series are given equal importance then it is called simple mean and when different items of a series are given different weight according with their relative importance is known weighted arithmetic mean .
- **Merits of mean**

1. Simplicity
2. Certainly
3. Based on all values
4. Easy to comparison

- **Demerit of mean**

1. Effect of extreme values
2. Mean value may not figure in the series
3. Misleading conclusion
4. Can not estimate with graph

- **Median –** Median is the middle value of the series when data are arranged in ascending order.
- **Quartile –** If a series is divided into four equal parts, the end value of each part is called a quartile.
- Merits of Median
  1. not affected by extreme value
  2. determined by graphical method
  3. possible even when data is incomplete
- Demerits of median
  1. not based on all time
  2. Arranging the data is ascending or descending order takes much time.

3. Not suitable for algebric treatment.
4. Affected by fluctuations of items.

- Mode - Mode is the value which occurs most frequently in the series.
- Merits
  1. It is easy to calculate.
  2. not affected by the extreme values.
  3. can be calculated by graph.
  4. most representative value in the given series.
- Demerits
  1. not based on all the items.
  2. not suitable for statistical treatment.
  3. procedure of grouping is complete.
  4. It is an uncertain mesune.
- Main purposes of and functions of averages.
  1. Comparisons
  2. Formulations of policies
  3. To represent a brief picture of data.
  4. One value for all the group.
- Relation among mean, median and mode

Mode = 3 median - 2 Mean

- Formula for of calculating mean

Types of series	Direct Method	Shortcut Method	Step Deriation Method
Individual	$\bar{x} = \frac{Ex}{N}$	$\bar{x} = A + \frac{Ed}{N}$	$\bar{x} = A + \frac{Ed'}{N} \times C$
Discrete	$\bar{x} = \frac{Efx}{N}$	$\bar{x} = A + \frac{Efd}{N}$	$\bar{x} = A + \frac{Efd'}{N} \times C$
Continuous	$\bar{x} = \frac{Efm}{N}$	$\bar{x} = A + \frac{Efd}{N}$	$\bar{x} = A + \frac{Efd'}{N} \times C$

- Combined Mean $\bar{X}_c = \frac{N_1\bar{X}_1 + N_2\bar{X}_2}{N_1+N_2}$
- Weighted Mean $\bar{X}_w = \frac{\sum WX}{\sum W}$

- Formula of calculating median

Measunes	Individual Series Size of item	Discrete Series Size of item	Continuous size of items	Series Formula
Median (Q_2)	$\left(\frac{N+1}{2}\right)^{th}$ term	$\left(\frac{N+1}{2}\right)^{th}$ term	$\frac{N}{2}$	$\frac{L_1 + \frac{N}{2} - CF}{f} \times i$
First (Q_1) Quartile	$\left(\frac{N+1}{4}\right)^{th}$ term	$\left(\frac{N+1}{4}\right)^{th}$ term	$\frac{N}{4}$	$\frac{L_1 + \frac{N}{4} - CF}{f} \times i$
Third $(Q_3)_3$ Quartile	$\left(\frac{N+1}{4}\right)^{th}$ term	$3\left(\frac{N}{4}\right)^{th}$ term	$3\left(\frac{N}{4}\right)$	$\frac{L_1 + \frac{3N}{4} - CF}{f} \times i$

- Formula of calculating mode

$$Z = L_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$$

Where L_1 = Lower limit of modal class

f_1 = Frequency of modal class

f_0 = Frequency of pre modal class

f_2 = Frequency of after modal class

$L = L_2 - L_1$

Class internal of the modal class.

- **1 Mark Question**
  1) What is meant by mean.
  2) Write two types of mean.
  3) Write one merit of median.
  4) Find mode 10, 5, 4, 6, 4, 5, 4, 12, 4, 15, 4
  5) Write the formula of combined mean.
  6) Define quartile.
  7) Define median.
  8) What is the relationship b/w mean, median and mode.
  9) What is the sum of derivations taken from mean in a sorie.

10) State one objective of an average.
11) Name the most popular statistical average.
12) Find median 4, 9, 10, 12, 14
13) State one disadvantage of mode.
14) How many columns are there in a grouping method ?
15) If mean is 40 and median is 48. Find mode.

- **3/4 Marks Question**

1) Give four objectives of statistical average.
2) Write 2 merits and 2 demerits of median.
3) Show that the sum of derivations of the values of the variable from their arithmetic mean is equal to zero.
4) Find mode.

X	10	20	30	40	50	60
F	13	15	20	33	15	10

5) Calculate Median

X	10	20	30	80	90	100
F	3	7	6	2	8	4

z = 40

6) The average marks for statistics in a class of 30 were 52. The top six students had an average of 31 marks. What were the average marks of other students ?

M = 30

7) Find weighted mean

Marks	10	15	20	25
Weight	4	3	2	1

8) State any four merits and demerits of mean.

Ans = 57.25

9) Define mode. Write any four merits of mode.

- **6 Marks Question**

Ans = 12

1) If $\overline{X} = 52$ find missing frequency

Wages	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Workers	5	3	4	?	2	6	13

f = 7

2) Find Median

Marks	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
No. of Students	14	28	33	30	20	15	13	7

M = 35.83

3) Find mean with step deviation method

Marks (Less than)	10	20	30	40	50
No. of Students	5	15	55	75	100

$\overline{x} = 30$

4) Draw a histogram and find mode. verify your answer with mathematical formula.

Wages	0-6	6-12	12-18	18-24	24-30	30-36
No. of Labour	12	24	36	38	37	6

z = 22

5) Find median with a diagram (Graph)

Age (years)	0-10	10-20	20-30	30-40	40-50	50-60
No fo Students	6	11	20	12	6	5

6) Find mode

M = 26.5

Mid Value	59	61	63	65	67	69	70	73
No. of Students	1	2	9	48	131	102	40	17

Z = 67.48

7) Find Median

C.I.	0-5	5-10	10-15	15-20	20-25	25-30
F	5	9	10	6	8	10

- **Answer of one marks question**

2) (a) Simple mean (b) Weighted mean

4) Mode = 4

5) $\overline{X}_c = \frac{N_1\overline{X}_1 + N_2\overline{X}_2}{N_1+N_2}$

9) Zero (0)

11) Mean

12) 4, 9, 10, 12, 14

$$\text{Median} = \left(\frac{5+1}{2}\right)^{th} \text{Term}$$

$$= \text{3rd Term}$$

$$= 10$$

14) Six

15) $Z = 3M - 2\overline{X}$

$= 3 \times 48 - 2 \times 40$

$= 144 - 80$

$= 64$

1. Which average would be suitable in the following cases ?
   a) Average production in factory per shift.
   b) Average wages in an industrial concern.
   c) In case of open ended frequency distribution

Ans. a) Arithmetic Mean
   b) Median.

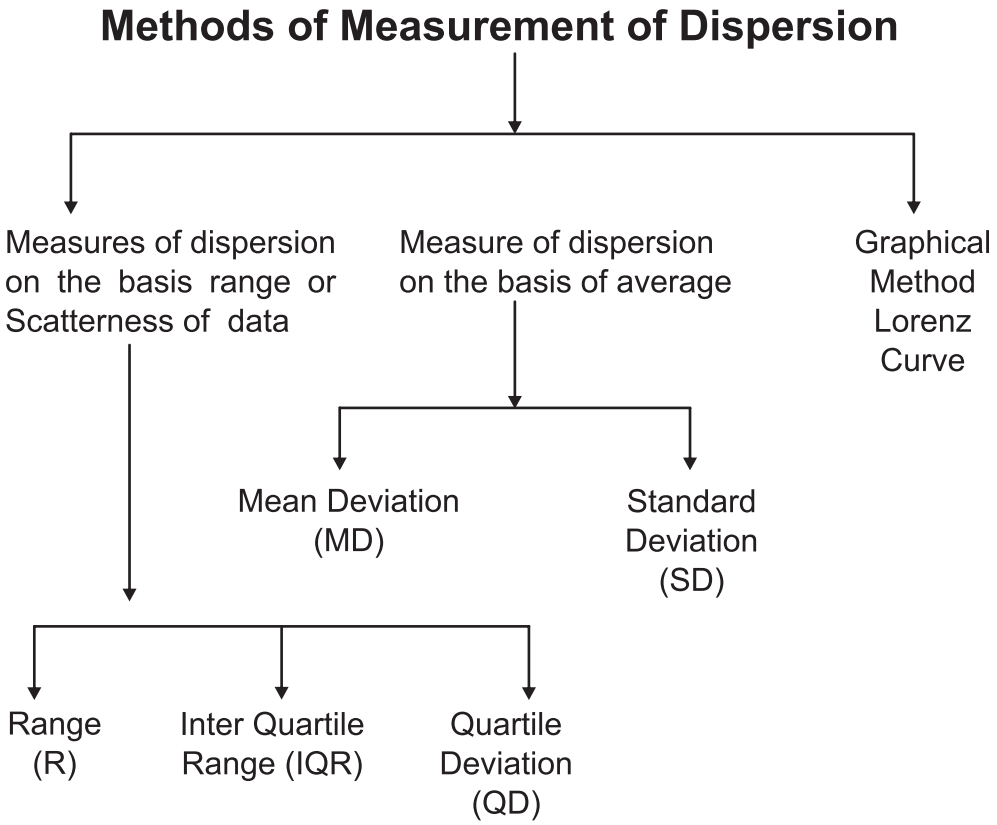
2. Write merit and demerit of mean or median.

Mean	**Median**
Merits	Merits
a) No. need of arrangement of data	a) Definite value
b) Easy to calculate	b) Expressed/determined graphically.
c) Based on all values of series	c) Easy of calculate
Demerits	**Demerits**
a) Can't be located graphically	a) Arrangement of data is required
b) Calculation not possible if single item missing	b) Not suitable for algebric treatment
c) Not used in case of qualitative measurement	c) Affected by fluctuations of items.

3. Requisites of an ideal averages
   i) Easy to understand.
   ii) Easy to compute.
   iii) Rigidly defined.
   iv) Based on all item 6 of series.
   v) Capable of algebric treatment
   vi) Least effect of fluctuation.

Unit-3
Measures of Dispersion

Scatterness of data from central value is known as dispersion. It indicates that how value of dispersion is different from its average value.



Measures of dispersion on the Basis of Range on Scatter ness of data

It includes the following three methods :

1) **Range :** It is the difference between largest and smallest value of dispersion.

   Range (R) = Largest value (L) – smallest value (S)

   $$\text{Coefficient of Range} = \frac{L - S}{L + S}$$

Note : More value of range means more dispersion and vice versa.

2. **Inter-Quatile Range (IQR)**

$IQR = Q_3 - Q_1$

Where Q3 = Upper / third quartile

Q1 = Lower / 1st quartile

Note: It is based on 50% of average value of distribution. It does not influence with extreme value.

3. **Quartile Deviation (QD)**

It is also called semi Inter Quartile Range.

$$QD = \frac{Q_3 - Q_1}{2}$$

$$\text{Coefficient of QD} = \frac{Q3 - Q1}{Q3 + Q1}$$

How to find quartile ?

- First of all, we should arrange the date into ascending or descending order.
- Find out cummutative frequency in discrete and continuous series.
- Use the following formula in different series to calculate quartile.

Individual Series	Discrete Series	Continuous Series
Q_1 = Size of $\left(\frac{N+1}{4}\right)^{th}$ items	Q_1 = Size of $\left(\frac{N+1}{4}\right)^{th}$ items	Q_1 = Size of $\left(\frac{N}{4}\right)^{th}$ items $Q_1 = L_1 + \frac{\frac{N}{4} - cf}{N} \times i$
Q_3 = Size of $\left(\frac{N+1}{4}\right)^{th}$ items	Q_3 = Size of $\left(\frac{N+1}{4}\right)^{th}$ items	Q_3 = Size of $3\left(\frac{N}{4}\right)^{th}$ items $Q_3 = L_1 + \frac{\frac{3N}{4} - cf}{N} \times i$

Where N = No. of items	Where N = $\sum f$ Sum of frequency	Where cf = cummutative frequency of preceding class i = difference b/w upper limit and lower limit of the quartile class

MEASURES OF DISPERSION ON THE BASIS OF AVERAGE

It includes the following two methods.

1. **Mean Deviation (MD)**

   It is calculated as an average on the basis of deviation obtained from any central value such mean, median and mode. Here we calculate it from deviation taken from mean on median. It takes only the absolute value which is indicated by two | | bars. It is based on all the values. If dispersion is measured by medium of mean then the dispersion will be minimum.

A. Mean deviation from Mean ($MD_{\bar{x}}$)

Individual series	Discrete and continuous series
$MD_{\bar{x}} = \frac{\Sigma \mid X - \bar{X} \mid}{N} = \frac{\Sigma \mid d\bar{x} \mid}{N}$ $\bar{X} = \frac{\Sigma X}{N}$ N = no. of items Coeff. of MD = $\frac{MD_{\bar{x}} =}{\bar{X}}$	$MD_{\bar{x}} = \frac{\Sigma f \mid X - \bar{X} \mid}{\Sigma f} = \frac{\Sigma f \mid d\bar{x} \mid}{\Sigma f}$ Σf = summation of frequencies f = frequencies $\bar{X} = \frac{\Sigma fx}{\Sigma f}$ Coeff. of MD = $\frac{MD_{\bar{x}} =}{\bar{X}}$

B. Mean deviation from media (MDM)

- First of all, we should arrange the items and classes into ascending or descending order.

- Calculate cummutative frequency in discrete series and continuous series
- Find out MDm in different series by using the following formula :

<table>
<tr><th>Individual Series</th><th colspan="2">Discrete and continuous series</th></tr>
<tr><td rowspan="2">$MD_m = \frac{\Sigma \mid X - M \mid}{N}$
$= \frac{\Sigma \mid d\bar{x} \mid}{N}$
m = size of $\left(\frac{N+1}{2}\right)^{th}$ items
N = no. of items.</td><td colspan="2">$MD_m = \frac{\Sigma f \mid X - M \mid}{\Sigma f} = \frac{\Sigma f \mid dm \mid}{\Sigma f}$</td></tr>
<tr><td>m = size of $\left(\frac{N+1}{2}\right)^{th}$ items
in discrete series
N = Σf</td><td>m = $L_1 + \frac{\frac{3N}{4} - cf}{N} \times i$
in continuous series
where
L_1 = Lower limit of median class</td></tr>
<tr><td>Coeff. of MD = $\frac{MD_m}{M}$</td><td colspan="2">Coeff. of MD = $\frac{MD_m}{M}$</td></tr>
</table>

2. **Standard Deviation (SD)**

   It is the square root of the arithmetic average of the square of the deviations measure from mean. It is also know as root mean square deviation. it is indicated by Greek Letter Sigma (σ). it is the best measure of dispersion. It removes the mathematical errors of mean deviation.

METHODS OF MEASUREMENT OF SD:

There are following four methods of measurement of standard deviation.

i) Actual mean method.

ii) Assumed mean method.

iii) Direct method.

INDIVIDUAL SERIES

Actual Mean Method	Assume of Mean Method	Step-deviation method	Direct method
$\bar{X} = \frac{\sum X}{N}$	$\bar{X} = A + \frac{\sum d}{N}$	$\bar{X} = \frac{A + \sum d'}{N} \times i$	$\bar{X} = \frac{\sum X}{N}$
$SD = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$ or $SD = \sqrt{\frac{\sum X^2}{N}}$	$SD = \sqrt{\frac{\sum d^2}{N} - \left(\frac{\sum d}{N}\right)^2}$	$SD = \sqrt{\frac{\sum d^2}{N} - \left(\frac{\sum d}{N}\right)^2} \times i$	$SD = \sqrt{\frac{\sum X^2}{N} - \left(\frac{\sum X}{N}\right)^2}$ or $SD = \sqrt{\frac{\sum X^2}{N} - (\bar{X})^2}$
$X = X - \bar{X}$	$d' = X - A$	$d' = \frac{X - A}{i}$	
X = deviation from actual mean	d = deviation from assumed mean		
	A = assumed mean		

DISCREET AND CONTINUOUS SERIES

Actual Mean Method	Assume of Mean Method	Step-deviation method	Direct method
$\bar{X} = \frac{\sum fx}{\sum f}$	$\bar{X} = A + \frac{\sum fd}{\sum f}$	$\bar{X} = \frac{\sum fd'}{\sum f} \times i$	$\bar{X} = \frac{\sum fx}{\sum f}$
$SD = \sqrt{\frac{\sum f(X - \bar{X})^2}{\sum f}}$ or $SD = \sqrt{\frac{\sum fX^2}{\sum f}}$	$SD = \sqrt{\frac{\sum fd^2}{\sum f} - \left(\frac{\sum fd}{\sum f}\right)^2}$	$SD = \sqrt{\frac{\sum fd^2}{\sum f} \times \left(\frac{\sum fd}{\sum f}\right)^2} \times i$	$SD = \sqrt{\frac{\sum fX^2}{\sum f} - \left(\frac{\sum fX}{\sum f}\right)^2}$ or $SD = \sqrt{\frac{\sum fX^2}{\sum f} - (\bar{X})^2}$
	$d' = X - A$	$d' = \frac{X - A}{i}$	

NOTE : X = Value of item in discrete series and it is the median value of CI.

$$\text{Coff. of SD} = \frac{SD}{\bar{X}} \text{ (in all series)}$$

- **Absolute and relative measures of dispersion.**

  Absolute measures of dispersion : It is measured in the same units of original data. It means, it is used only within a series and is measured in the same unit as that of series. It includes Range, IQR, QD, MD and SD.

  Relative measures of Dispersion : This measure is independent from units. it is calculated as the percentage or the coefficient. It is used for comparing two or mor series where units of measures are different.

  It includes coeff. of range, coeff. of QD, coff of MD, and coeff, of SD.

  Coefficient of Variation (CV) : It is the most important relative measures of dispersion. When we multiply coefficient of standard deviation by 100 then we get coefficient of variation.

$$CV = \frac{SD}{\bar{X}} X\ 100 \quad = \quad \frac{\sigma}{\bar{X}} X\ 100$$

  more the value of CV means more variation, and less consistency, less uniformity, less homogeneity and vice versa.

- **Graphical Method : Lorenz Curve**

  This method was developed by Dr. Max. O. Lorenz it estimates dispersion. It is a graphical method. It is useful in the study of distribution of income and wealth profits wages and sale, purchase turnover etc.

  In this method, value the frequencies are cummulated and their percentage are calculated. These values are plotted on the graph paper and to join all the points with a curve. Thus the obtained curve is called Lorenz Curve.

  The nearer the curve is to the line of equal distribution, lesser will be dispersion and the further the curve is from the line of equal distribution, the greater will be dispersion.

  The most important draw book of this curve is that is does not give a quantitative measure of dispersion.

- **Construction of Lorenz Curve**

  1) Series is converted into a cummulative frequency series, the

cummulative sum of items is assumed to be 100 and different items are converted into percentage of the cummulative sum.

2) Cummulative sum of frequency is assumed to be 100 and different frequencies are converted into percentage of sum of frequency.

3) Cummulative frequencies are plotted on x-axis and cummulative items are plotted on y-axis of graph.

4) On both axis values are plotted of own 1–100.

5) A diagonal line joining 0, 0 with cummulative frequency 100,100 is called line of equal distribution.

6) Actual data are plotted by joining different points. This Lorenz Curve.

- **One Mark Questions :**

1) What is inter quartile range?

2) Give the formula of calculating coefficient of variation.

3) What is Lorenz Curve?

4) Calculate Range –

22, 35, 32, 45, 42, 48, 39

5) Which graphical method is used to measure dispersion?

6) Give meaning of dispersion.

7) How is coefficient of mean deviation computed?

8) Which measure of dispersion covers middle 50% of the items?

9) Write one major demerit of mean deviation?

10) What do you mean by relative measure of dispersion?

- **Short Answer Type Questions (3/4 Marks)**

1) Mention important measures of dispersion.

2) Mention any two merits and two demerits of mean deviation.

3) Distinguish between mean deviation and standard deviation.

4) What do you understand by dispersion?

5) Discuss the relative merits of range, mean deviation, deviation and standard as measures of dispersion.

6) Find the range and coefficient of range of the following :

Marks	10	20	30	40	50	60	70
No. of students	8	12	7	30	10	5	2

(Range = 60 marks; coefficient of range = 0.75)

- **6 Marks Questions**

1) Discuss the merits, demerits and uses of range.

2) What is the meaning of Lorenz Curve? State the steps involved in drawing a Lorenz Curve.

3) What do you mean by mean deviation? In what way is mean deviation a better measure of dispersion than range and quartile deviation?

4) What do understand by dispersion? Describe the various methods of computing dispersion?

- **1 Mark Answers**

1) The difference in the two values of quartile is called inter quartile range ($Q_3 - Q_1$).

2) Coefficient of variation = $\frac{\sigma \times 100}{\bar{X}}$

3) Lorenz Curve is the graphic presentation of studying dispersion.

4) Range = Largest Value – Smallest Value

= 48 – 22 = 26

5) Lorenz Curve method is used to measure dispersion.

6) Dispersion is a measure of the variation of the item from a central value.

7) Mean deviation = $\frac{\sum f\,(D)}{\bar{X}}$

8) Inter quartile range.

9) The major demerit of mean deviation is that it ignores $\pm$ sings.

10) Relative measures are expressed in ratios or percentage, also knows as coefficient of dispersion.

Frequently Asked Questions
MEASURES OF DISPERSION

Q1. What do you mean by Lorenz Curve.

Ans. It is a graphic representation of dispersion, which studies about distribution of income, wealth, profit, wages etc.

Q2. What is variance.

Ans. The square of standard deviation is known as variance

Variance = $\sigma^2 = \frac{\sum x^2}{N}$

Q3. From the following data find out which factory may be considered more uniform.

	No. of Workers	
Wages (in Rs.)	**Factory A**	**Factory B**
20	30	45
60	25	35
100	30	25
140	45	40
180	25	25
220	13	20
260	24	5
300	8	5

Hints : Calculate $\overline{X}$ and standard deviations of both factory.

Then calculate co-efficient of variation of both factory with help of

Formula C.V. $= \frac{\sigma}{\overline{X}} \times 100 = \frac{\text{Standard Deviation}}{\overline{X}} \times 100$

Factory A $\rightarrow$ = 137, S.D. = 80.8, C.V. = 59%

Factory B = 114, S.D. = 75.6, C.V. = 66%

Factory A is more uniform.

Unit-3
Correlation

Correlation is a statistical device which measures the quantitative relationship between two variable. It measures the direction and intensity of relationship among variables. Thus, correlation measures co-variation, not causation.

- **Types of Correlation**

  1) Positive and negative correlation :

     When both variables (say x and y) move in the same direction then it is called positive correlation. For eg. increase in temperature and increase in sale of AC.

     When both variable (say x and y) move in the opposite direction then it is called negative correlation for eg. increase in temperature and decrease in sale of Heater.

  2) Linear and Non-linear correlation :

     When both the variables (say x and y) change in the same proportion, it is called linear correlation. When both the variables (say x and y) change in the different proportions, it is called non-linear correlation.

  3) Simple, Partial and Multiple Correlation :

     When we study the correlation between two variables then it is called simple correlation. In this correlation. There are two variables one is independent and another is dependent.

     When we study the correlation between more than two variables is called multiple correlation. If we study correlation between two variables keeping the content of all other variables then it is called partial correlation.

DEGREE OR MAGNITUDE OF CORRELATION

Degree	Positive	Negative
Perfect	+1	–1
Higher	+ 0.75 – + 1	– 0.75 – – 1
Medium	+ 0.25 – + 0.75	– 0.25 – – 0.75
Low	0 – + 0.25	0 – – 0.25
Zero (Absence of correlation)	0	0

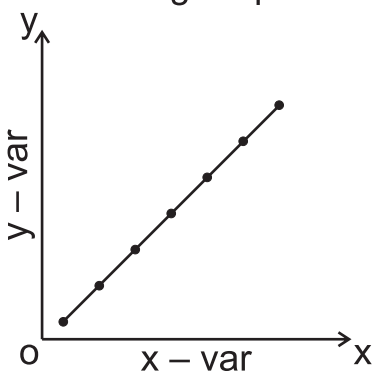
- Methods of measurement of correlation :

  There are following methods.

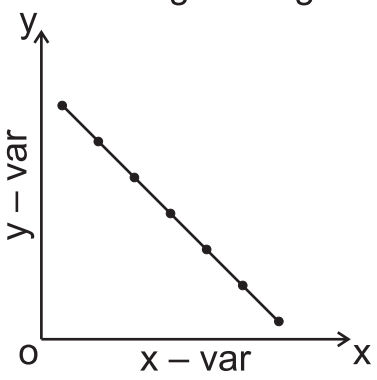
  1) Scatter Diagram Method

     It is a graphical method. In this method we use graph paper. We show X-variable on x-axis and y-variable on the y-axis. We plote the corresponding value of both variable by dot (.) on the graph paper.

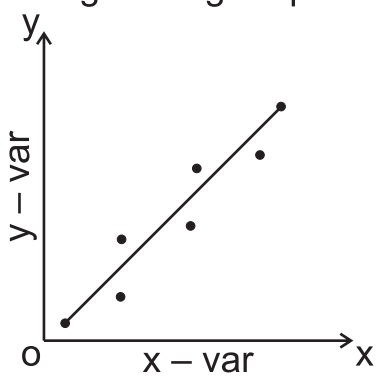
Perfect degree positive



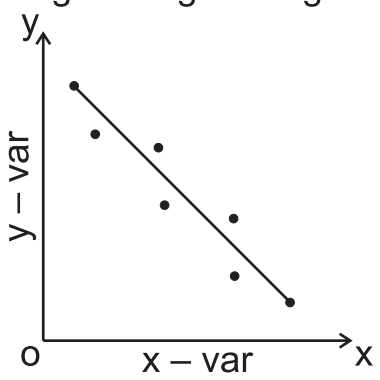
Perfect degree negative



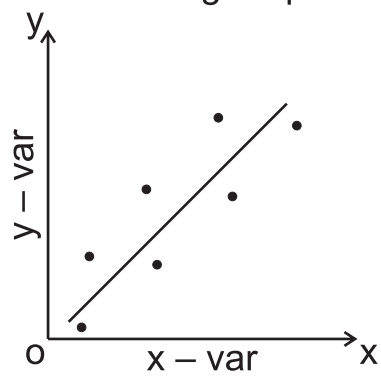
Higher degree positive



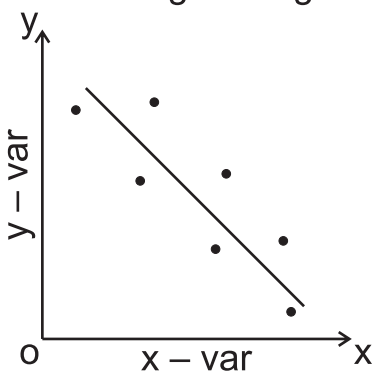
Higher degree negative

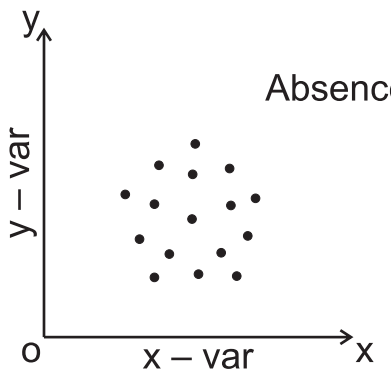


Lower degree positive



Lower degree negative





Absence of correlation

2. Karl Pearson's Method

It is also called product moment method of correlation. It is indicated by r. It is based on arithmetic mean and standard deviation.

Let there are two variables x and y.

Mean of x-series is $\overline{X} = \frac{\Sigma X}{N}$ and mean of y-series is $\overline{Y} = \frac{\Sigma Y}{N}$.

Standard deviation of x-series is $\sigma x = \sqrt{\frac{\Sigma x^2}{N}}$ and standard deviation of y-series is $\sigma y = \sqrt{\frac{\Sigma y^2}{N}}$. Here $x = x - \overline{x}$ and $y = y - \overline{y}$.

Covariance of variable x and y is

$$\text{Cov. (x, y)} = \frac{\Sigma (X-\overline{X})(Y-\overline{Y})}{N} = \frac{\Sigma xy}{N}$$

then we find Karl Pearson's coefficient of correlation

$$r = \frac{\text{Cov. (x,y)}}{\sigma x \, . \, \sigma y}$$

OR

$$r = \frac{\Sigma xy}{N.\sigma x \, . \, \sigma y}$$

OR

$$r = \frac{\Sigma xy}{N\sqrt{\frac{\Sigma x^2}{N}} \quad X \sqrt{\frac{\Sigma y^2}{N}}}$$

OR

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2} \times \sqrt{\Sigma y^2}} = \frac{\Sigma xy}{\sqrt{\Sigma (X-\overline{X})^2} \sqrt{\Sigma (Y-\overline{Y})^2}}$$

Therefore, the following methods are used to measure Karl Pearson's coef.. of correlation.

1) Actual mean method

$$r = \frac{\sum xy}{\sqrt{\sum x^2}\ \sqrt{\sum y^2}}$$

where $x = X - \overline{X}$; $Y = Y - \overline{Y}$

$$\overline{X} = \frac{\sum X}{N} ; \quad \overline{Y} = \frac{\sum Y}{N}$$

N = No. of observations

2) Assumed mean method

$$r = \frac{N \sum dxdy - (\sum dx)(\sum dy)}{\sqrt{N.\sum dx^2 - (\sum dx)^2}\ \sqrt{N.\sum dy^2 - (\sum dy)^2}}$$

OR

$$r = \frac{\sum dxdy - \frac{(\sum dx)(\sum dy)}{N}}{\sqrt{\sum dx^2 - \frac{(\sum dx)^2}{N}}\ \sqrt{\sum dy^2 - \frac{(\sum dy)^2}{N}}}$$

Where dx = X– A ; dy = Y– A

A= Assumed mean from x and y series.

3) Step – deviation method

$$r = \frac{N. \sum dx^1 dy^1 - (\sum dx^1)(\sum dy^1)}{\sqrt{N.\sum dx'^2 - (\sum dx')^2}\ \sqrt{N\, dy'^2 - (\sum dy')^2}}$$

OR

$$r = \frac{N. \sum dx^1 dy^1 - \frac{(\sum dx^1)(\sum dy^1)}{N}}{\sqrt{\sum dx^2 - \frac{(\sum dx)^2}{N}}\ \sqrt{\sum dy'^2 - \frac{(\sum dy')^2}{N}}}$$

Where $dx^1 = \frac{X - A}{i}$; $dy^1 \ \frac{Y - A}{i}$

If we assume that $dx^1 = U = \frac{X-A}{l}$ and

$$dy^1 = V = \frac{Y-A}{l}$$

then above formula can be written as

$$r = \frac{\sum UV - \frac{(\sum U)(\sum V)}{N}}{\sqrt{\sum U^2 - \frac{(\sum U)^2}{N}} \sqrt{\sum V^2 - \frac{(\sum V)^2}{N}}}$$

then correlation b/w x and y (rxy) is same as correlation b//w ruv.

- Direct Method

$$r = \frac{N.\sum XY - (\sum X)(\sum Y)}{\sqrt{N.\sum X^2 - (\sum X)^2} \sqrt{N.\sum Y^2 - (\sum Y)^2}}$$

OR

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{N}}{\sqrt{\sum X^2 - \frac{(\sum X)^2}{N}} \sqrt{\sum Y^2 - \frac{(\sum Y)^2}{N}}}$$

- **Properties of correlation**

i) It is independent from unit.

ii) Negative value of coeff. of correlation indicates negative correlation while positive value indicates positive correlation.

iii) Coeff. of correlation lies between –1 and +1

i.e $-1 \leq \gamma \leq +1$

iv) If r = 0, it means of absence of correlation.

v) If higher value of r shows higher degree linear correlation and a lower value of r shows lower degree of linear corr.

vi) If r = +1, if means perfect degree positive correlation between two variable and i f r = –1, it means perfect degree negative correlation between two variables.

vii) It is independent of change of origin and scale of the variables. It is proved by value of r which is calculated by step deviation method.

- **Spearman's coefficient of correlation.**

It is also called rank order coefficient of correlation. It is useful for qualitative observations. When values of variables are not impressed in quantitative measures then it is used to measure correlation. For example honesty, morality, character, beautifulness, originality, leadership, quality, wishdom etc. It is besteralternative to determine the ranks instead of quantification of qualitative information.

It is indicated by rk or Roh (P).

This method is useful in the following three situation :

1) When ranks are given :

If ranks are already given then

$$rk = 1 - \frac{6 \sum D^2}{N^3 - N}$$

Where N = No. of observations

D = Deviation / Difference between ranks of two variables

2) When ranks are not given.

- First of all rank the values of variables. 1st rank to largest value, 2nd rank to second largest value, 3rd rank to 3rd largst value and so on.
- Find deviation or difference between ranks of two series.
- Use the following formula to find correlation.

$$rk = 1 - \frac{6 \sum D^2}{N^3 - N}$$

3. When values are repeated.

- When two or more than two values are equal then average rank is given.
- Next rank to next value and so on.
- Use the following formula to find correlation.

$$r_R = 1 - \frac{6\left[\sum D^2 + \frac{1}{12}(m_1^3 - m_1)\frac{1}{12}(m_2^3 - m_2) + ...\right]}{N^3 - N}$$

Where m_1, m_2, ... indicate repeation of values and $\frac{1}{2}(m_1^3 - m_3)$, $\frac{1}{2}(m_2^3 - m_2)$ ..... their corresponding correction coefficient.

- **Similarities between Karl Pearson's and Spearman's. Correlation.**
  - The values of both correlation lie between ± 1.
  - When $r_R = -1$; it means perfectly disagree. In this case ranks are such that highest ranking X goes with the lowest ranking Y and so on, we have perfect negative correlation with coefficient of – 1.
  - When $r_R = +1$, it means perfectly agree. If each X and its paired Y have exactly the same rank, we have perfect positive correlation with coefficient if + 1.
- **Dissimilarities**
  - Ranks correlation gives less importance to the extreme values and it does not based on the numerical value of all information. So, result of this method is not accurate as compared to product moment method. It is because that product moment method gives more importance to extreme values because it is based on all actual values.
  - It is more useful when no. of items are small, data are given as ranks, scores etc. and data are not numerically expressed than product moment methods.
- **Very Short Answer Type Questions : (1 marks questions)**
  1) What is meant by correlation?
  2) List some variables where accurate measurement is difficult.
  3) What is negative correlation?
  4) Give the meaning of positive correlation.
  5) What is the range of simple correlation coefficient?
  6) State the type of correlation when two variables change in the same ratio.

7) Give two examples of positive correlation?

8) Mention the principal short coming of scatter diagram as a method of estimating correlation.

9) Give two examples of negative correlation.

10) When is rank correlation method used?

11) Mention the names of different methods for measuring correlation.

12) What is the main demerit of spearman's rank method?

13) Mention the principal short coming of Karl Pearson's coefficient correlation.

14) If $r_{xy} = 0$, then the variables x and y are :

    i) Linearly related

    ii) Not linearly related

    iii) Independent

15) The unit of correlation coefficient between height in feet and weight in kilograms is :

    i) kg / feet

    ii) percentage

    iii) non-existent

16) Which method of measuring correlation measures any type of relationship?

    a) Karl Pearson's Co-efficient of correlation.

    b) Spearman's rank correlation.

    c) Scatter Diagram.

17) If precisely measured data are available, the simple co-efficcient correlation is :

    a) more accurate than rank correlation co-efficient

    b) less accurate than rank correlation co-efficient

    c) as accurate as the rank correlation co-efficient

- **Short Answer Type Questions : (3/4 mark questions)**

1) What is meant by correlation? What are the properties of coefficient of correlations?

2) Interpet the values of r as 1, –1 and 0.

3) Calculate the correlation coefficient between x and y and comment on their relationship.

X	–3	–2	–1	1	2	3
Y	9	4	1	1	4	9

(Ans r = 0)

4. Calculate the correlation coefficient between x and y and comment on their relationship :

X	1	3	4	5	7	8
Y	2	6	8	10	14	16

(Ans r = +1)

5. Plot the following data as a scatter diagram and comment over the result :

X	11	10	15	13	10	16	13	8	17	14
Y	6	7	9	9	7	11	9	6	12	11

6. Calculate Karl Pearson's coefficient of correlation on the following data :

X	15	18	21	24	27	30	36	39	42	48
Y	25	25	27	27	31	33	35	41	41	45

7. From the following data, compute the product movement correlation between x and y.

		X series	Y series
i)	No. of items	15	15
ii)	Arithmetic mean	25	18
iii)	Square of deviations From arithmetic mean	136	138

iv) Summation of products of deviations of X and Y series from respective means = 122

(Ans. r = 0.89)

8. Number of pairs of observations of x and y series = 10

   X series Arithmetic average = 65

   Standard deviation = 23.33

   Y series Arithmetic average = 66

   Standard deviation = 14.9

   Summation of products of corresponding deviation of X and Y series = + 2704

   Calculate product moment correlation of x and y series.

   (Ans. r = + 0.78)

9. Calculate spearman's rank correlation from the following data X 10

X	10	12	8	15	20	25	40
Y	15	10	6	25	16	12	8

   (Ans. r = + 0.14)

10. Two judges in a beauty competition rank the twelve entries as follows :

X	1	2	3	4	5	6	7	8	9	10	11	12
Y	12	9	6	10	3	5	4	7	8	2	11	1

   (Ans. r = –0.45) Calculate rank correlation coefficient.

11. Calculate the rank coefficient correlation of the following data :

X	68	75	90	75	50	62	40	35
Y	10	12	14	10	10	13	9	8

   (Ans. r = + 0.76)

12. Does correlation imply causation?

13. Does zero correlation mean independence ?

14. Why does rank correlation coefficient differ from Karl Pearson's coefficient of correlation?

15. When is rank correlation coefficient more precise than simple correlation coefficient?

- **Long Answer Type Questions : (6 Marks Questions)**

1) Discuss Karl Pearson's method of calculating coefficient of correlation. Give its merits and limitations.

2) In a beauty contest, three judges accorded following ranks to 10 participants :

Judge I	1	6	5	1	0	3	2	4	9	7	8
Judge II	3	5	8	4	7	1	0	2	1	6	9
Judge III	6	4	9	8	1	2	3	1	0	5	7

Find out by Spearman's rank difference method which pair of judges has a common taste in respect of beauty.

(Ans. rs I & II = – 0.21; rs II & III = – 0.29)

3. What are the advantages of spearman's rank correlation coefficient over Karl Pearson's correlation coefficient? Explain the method of calculating Spearman's rank correlation coefficient.

4. Following are the heights and weights of 10 students in a class. Draw a scatter diagram and indicate whether the correlation is positive or negative.

Height (in inches)	72	60	63	66	70	75	58	78	72	62
Weight (in Kg.)	65	54	55	61	60	54	50	63	65	50

5. Calculate the correlation coefficient of ten marks obtained by 12 students Mathematics and Statistics and interpret it.

Marks (in Maths)	50	54	56	59	60	62	61	65	67	71	71	74
Marks (in Statistics)	22	25	34	28	26	30	32	30	28	34	36	40

(Ans. r = 0.78)

Answer of one mark questions

1. Correlation is a statistical tool which studies the relationship between two variables.
2. Beauty, bravery, wisdom, ability etc.
3. The correlation is said to be negative when the variable move in opposite direction.
4. The correlation is said to be positive when the variable move together in the same direction.
5. $-1 \leq r \leq 1$
6. Perfect correlation.
7. i) Age of husband and age of wife.
   ii) Increase in height and weight.
8. Scatter diagram does not indicate the exact numerical value of correlation.
9. i) Sale of wollen garments and day temperature.
   ii) Yield of crops and price.
10. When data are of qualitative nature like beauty, honesty etc.
11. i) Scatter diagram
    ii) Karl Pearson's coefficient of correlation.
    iii) Spearman's Rank correlation.
12. This method can not be employed for finding out correlation in a grouped frequency distribution.
13. The value of the coefficient is affected by extreme items.
14. Independent
15. Non-existent
16. Karl Pearson's coefficient of correlation.

Frequently Asked Question

Q1. Who gave the rank difference method of correlation? 1 marks.

Hint : Prof. Charles Speaman

Q2. Define correlation. Give an example each of positive and negative correlation. 3 marks.

Hints : Positive correlation – Increase in Price and increase in supply

Negative correlation – Rise in price and full in demand.

Q3. Compute Karl Pearson's coefficient from following data : (6 marks)

X	10	12	11	13	12	14	9	12	14	13
Y	7	9	12	9	13	8	10	2	7	13

Hints :

i) Compute mean of both series ($\bar{x}\,\bar{y}$)

ii) Take deviation from the mean (xy)

iii) Square the deviation of (x^2y^2)

iv) Compute the product of (xy)

v) Use following formula :

$$r = \frac{\sum xy}{\sum x^2 \times \sum y^2}$$

= Answer = – 0.115 (Low degree of negative correlation)

4. Find out rank difference correlated of X and Y.

X	80	78	75	75	58	67	60	59
Y	12	13	14	14	14	16	15	27

X	R1	Y	R2	D=R1–R2	D^2
80	1	12	8	–7	49
78	2	13	7	–5	25
75	3.5	14	5	–1.5	2.25
75	3.5	14	5	–1.5	2.25
58	8	14	5	3	9
67	5	16	2	3	9
60	6	15	3	3	9
59	7	17	1	6	36
$ED^2 = 142$					141.5

$$rk = 1 - \frac{6\left[\sum D^2 + \frac{1}{12}(m_1^3 - m_1)\frac{1}{12}(m_2^3 - m_2)\right]}{N^3 - N}$$

$$rk = 1 - \frac{6\left[141.5 + \frac{2^3 - 2}{12} + \frac{3^3 - 3}{12}\right]}{8^3 - 8}$$

$$= 1 - \frac{6\,(141.5 + 0.5 + 2)}{504}$$

$$= 1 - \frac{6 \times 144}{504}$$

$$= \frac{504 - 864}{504}$$

$$= \frac{-360}{504}$$

$$= -0.71$$

Unit - 3
Index Numbers : An Introduction

Index numbers are "indicating numbers" used to show changes in variable of various fields in statistics and economics. Index numbers play a major role in economics and statistics.

MEANING

Index numbers are meant to study the change in the effects of such factors which cannot be measured directly.

An index number is an economic and statistic data figure reflecting price or quantity compared with a standard value or base value.

An number indicating change in magnitude, as of price, wage, employment, or production shifts, relative to the magnitude at a standard or base value usually taken as 100.

TYPES OF INDEX NUMBERS

Index numbers are names after the activity they measure. Their types are as under :

1. **Price Index :** Measure changes in price over a specified period of time. It is basically the ratio of the price of a certain number of commodities at the present year as against base year. Some price index numbers are **Wholesale price Index (WPI), Consumer Price Index (CPI) or Cost of Living Index (COLI))**
2. **Quantity Index :** As the name suggest, these indices pertain to measuring change in value of commodities like goods produced or goods consumed, etc. An important quantity index number is **Index of Industrial Production (IIP)**
3. **Value Index :** These pertain to compare changes in the monetary value of imports, exports, production or consumption of commodities.

WHOLESALES PRICE INDEX (WPI)

Wholesale Price Index (WPI) represents the price of goods at a wholesale stage i.e. goods that are sold in bulk and traded between organizations instead of consumers.

Where

Q_0 = Quantity in Base Year

P_0 = Price in Base Year

P_1 = Price in Current year

$$WPI = \frac{\Sigma Q_0 P_1}{\Sigma Q_0 P_0} \times 100$$

CONSUMER PRICE INDEX (CPI) OR COST OF LIVING INDEX (COLI)

A consumer price index (CPI) measures change in the price level of a market basket of consumer goods and services purchased by households.

$$CPI = \frac{\Sigma Q_0 P_1}{\Sigma Q_0 P_0} \times 100$$

CPI through family Budget method

$$CPI = \frac{\Sigma RW}{\Sigma W} \times 100$$

Where W = Weightage

$$R = \frac{P_1}{P_0}$$

P_1 = Prices in current year

P_0 = Price in Base yera

INDEX OF INDUSTRIAL PRODUCTION (IIP)

The index of industrial production is a composite indicatior that measures the short-term changes in the quantity of production of production of industrial products during a given period with respect to that in a chosen base period

$$IIP = \frac{\Sigma\left(\frac{Q_1}{Q_0}\right)W}{\Sigma W} \times 100$$

Where Q_1 = Production level in current year

Q_0 = Production level in base year

W = Weightage of different industrial output

Inflation and Index Number

Inflation is the percentage increases in price level i.e prices of a basket of goods and services over a specific period of time

$$\text{Inflation Rate} = \frac{I_2 - I_1}{I_1} \times 100$$

I_2 = Index of current period

I_1 = Index of previous period

INDEX NUMBERS : AN INTRODUCTION

- **1 Mark Question**
  1) What do you mean by index numbers ?
  2) Define base year.
  3) Define current year.
  4) Give the formula to calculate the rate of inflation.
- **3 & 4 Marks Question**
  1) What is inflation ?
  2) What does wholesale price index indicate.
  3) Write the formula for calculating index of industrial production.
- **6 Mark Question**
  1) Define the inflation and write the formula for calculating rate of inflation with the help of index number.
  2) Explain about some important index numbers CPI, WPI and IIP ?

One mark answer

1) An index number is a statistical device for measuring changes in the magnitude of a group of relative variables.
2) It refer to year of reference from which we want measure extent of change in the current year.
3) Is the year for which average change is to be measured.
4) $\frac{A_2 - A_1}{A_1} \times 100$

FREQUENTLY ASKED QUESTION
INDEX NUMBERS

1. What is the symbol of the price of the base year ?
   (Hint: P_0)
2. State characteristics of index number
   Hint :
   1) Expressed in numbers
   2) Relative measure
   3) Average of percentage
   4) Basis for comparison
   5) Universal utility
3. Write three uses of wholesale price Index /
   Hints :
   1) Forecasting demand and supply.
   2) Determination of Real Change in Aggregate.
   3) Indicator of Rate of Inflation.

INDEX NUMBER

Multiply choice question

1. An index number which accounts for the relative importance of the items is know as.
   a) Weighted index
   b) Simple aggregative index
   c) Simple average of relatives
2. In most of the weighted index numbers weight pertains to
   a) Base year b) Current year
   c) Both base and current year
3. The impact of change in price of a commodity with little weight in th index will be.
   a) Small b) large d) uncertain
4. A consumer price index measures change in
   a) Retail prices b) Wholesale price
   c) Producer prices
5. In general, inflation is calculated by using
   a) Wholesale price index b) consumer price index
   c) producer's price index
6) the item having the highest weight in consumer price index for industrial worker is
   a) Food b) Housing c) Clothing

   Ans. 1) a 2) a 3) a 4) a 5) a 6) a

SOME MATHEMATICAL TOOLS USED

Relationship between two variables can express in three ways -

1) In the form of table
2) In the form of diagram
3) In the form of an algebric equation.

Economics now prefer to describe relationship between different variables in terms of algebric equations

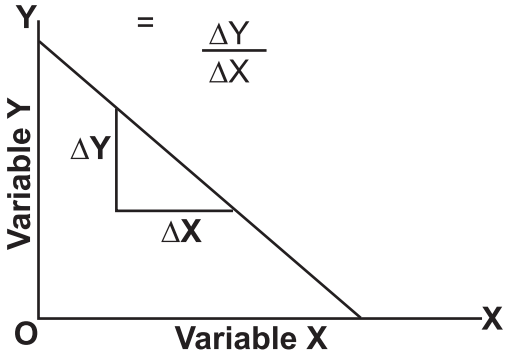
Functional Relationship - It refers to the 'cause and effect' relationship between the variables.

(I) SLOPE OF A LINE (LINEAR CURVE)

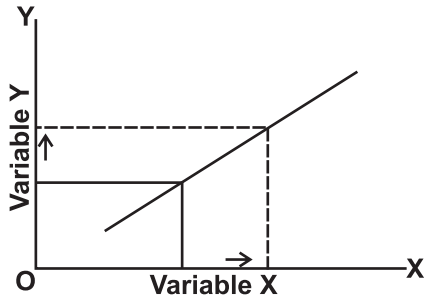
Straight lines have the same slope. It means change in one variable in response to a unit change in other is same everywhere on the straight line. The slope of a straight line is calculated as :

$$\text{Slope} = \frac{\text{Change in variable on the Y - axis}}{\text{Change in variable on the X - axis}}$$

$$= \frac{\Delta Y}{\Delta X}$$

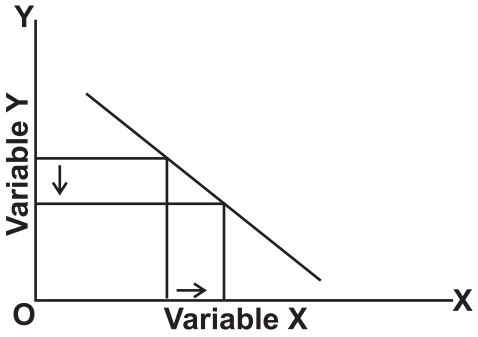


1) Positive Slope - It the line is upward slopping then the two variable are directly related.

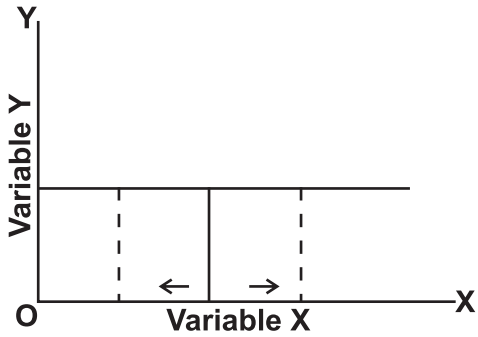


2) Negative Slope - When the Line is downward Slopping, then the two

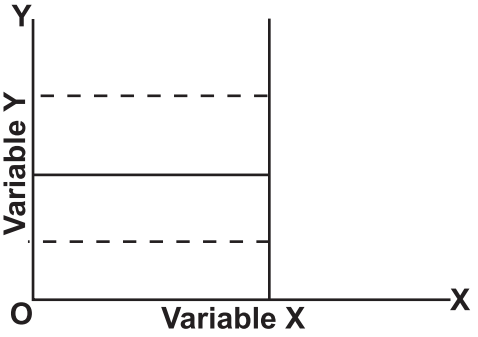
variable are inversely related.



3) Zero Slope – In case of a horizontal straight line, the slope is Zero as OY is zero.



4) Infinite Slope – In case of a vertical straight line, the slope is infinite as OY is too big to be measured.

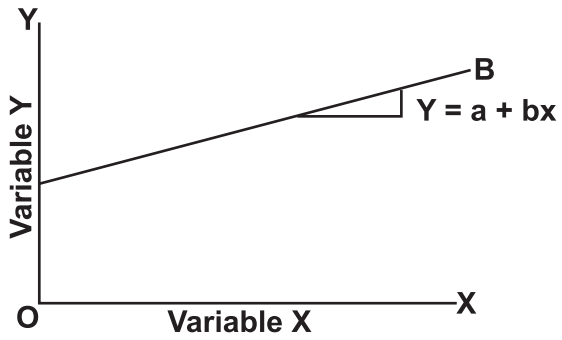


(II) Equation of Line

If the slope is constant throughout, the curve will be a straight line.

1) Equation of on upward slopping straight line curve:

$Y = a + bx$



a = Value of the Y - axis intercept (OA) of the curve AB.

b = It is constant = $\frac{\Delta Y}{\Delta X}$

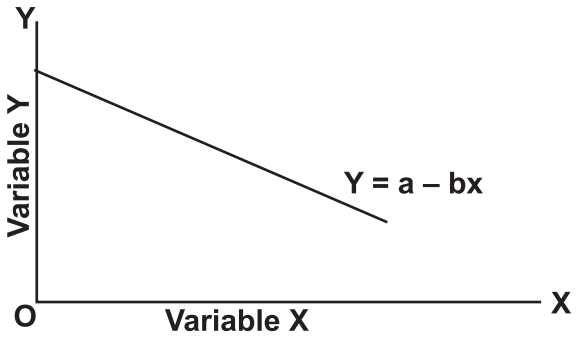
x = Independent Variable

+ = Sign indicate direct relation between x and y

2) Equation of a downward slopping Straight Line curve –

Y = a - bx

(–) = Sign indicate inverse relation between x and y



III SLOPE OF A CURVE

A non–linear curve is the one, whose slope changes. Unlike the slope of a straight line, the slope of a curve is continuously changing

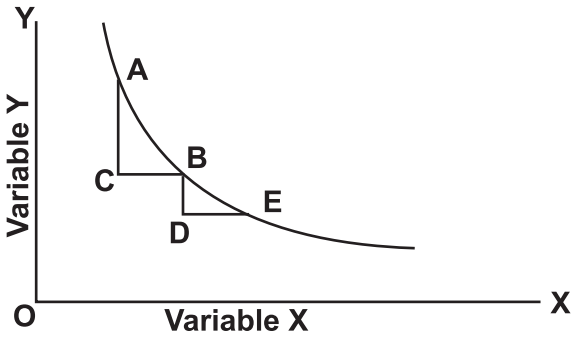
(a) Downward slopping converse curve –

In case of movement from A to B

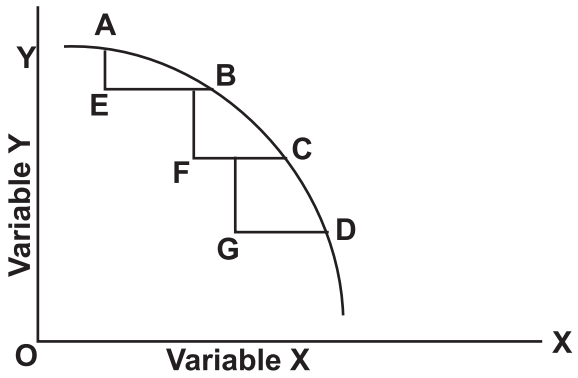
Slope = $\frac{\Delta Y}{\Delta X}$ $\frac{AC}{CB}$

In case of movement from B to E

slope = $\frac{\Delta Y}{\Delta X} = \frac{BD}{DE}$



2) Downward slopping concave curve – The slope of concave curve tends to rise.



UNIT - 4
INDIAN ECONOMY ON THE EVE OF INDEPENDENCE

Points to remember

- The sole purpose of the British colonial rule in India was to reduce the country to being a feeder economy for great British own repidly expanding modern industrial base.
- Conditions in the Indian economy on the eve of independence.

i) Low level of economic development :- The colonial govt., never made any sincere attempt to estimate India's national per capita income.

The estimates given by Dr. V.K.R.V Rao-growth rate of GDP was about 2% per annum white the growth of percapita output was just 0.5% per annum.

ii) Backward agriculture sector : Due to land tenure system Ryotwari system, Mahalwari System etc.

a) Land tenure system - Zamidari system, Mahalwari system and Ryotwari system.
b) Forced commercialisation of agriculture.
c) Partition of the country .

iii) Less developed industrial sector:

a) De-industrialization - decline of Indian handicraft industry.
b) Capital good industries were lacking.
c) Limited operation of public sector.
d) Discriminatory tariff policy.

iv) Foreign trade characteristic :

a) Net exporter of raw material and importer of finished goods.
b) Britain had monopoly control on foreign trade.
c) Drain of Indian's wealth

v) Adverse demographic condition :-

a) High death rater - 45 per thousand .
b) High infant mortality rate - 215 per thousand .
c) Mass illiteracy - 84% literate.

d) Low life expectancy - 32 years

e) Low standard of living - people used to spend 80% to 90% of their income on basic needs.

f) Lack of public health facilities.

vi) Underdeveloped infrastructure :-

Absence of good roads, electricity generation, health, education and communication. However some efforts have been made to develop basic infrastructure like roads, railways, parts, water transport, post and telegraph by the British rulars. The main motive was not to provide basic amenties to the Indian people but for their colonial interest.

vii) More Dependence on primary sector :-

a) Largest share of work force was 72% was engaged in agriculture.

b) 10% in manufacturing while 18% workforce were engaged in service sector.

- **Some positive side - effects of the British rule in India.**

a) Provide transport facilities, largely in terms of railways.

b) Development of parts.

c) Provision of post and telegraph services.

d) British govt. left a base of a strong and efficient administrative set up.

e) Political and economic unification of the country.

f) Evolution of Banking and monetary system.

- **Some negative side effects of the British rule in India :-**

a) Decline of Indian handicraft industry.

b) Net exporter of raw material and importer of finished goods.

c) Britain had monopoly control on foreign trade.

d) Forced commercialisation of agriculture.

- **One Marks Questions :-**

1) What do you mean by infant mountality rate ?

2) What is meant by commercialisation of agriculture ?

3) What was the infant moutality rate of Indian during British rule ?

4) State the life empectancy in Indian during British rule ?

5) What does the emport surplus mean ?
6) The British official census in India occured in which year ?
7) Which industries were adversely effected due to patition ?
8) Give the name of one economist who estimated India's per capita income during colonial period ?
9) At the time of independence liberaty rate was ?
10) What percentage of India's working population was engaged in secondary sector during British rule ?

3/4 Marks Questions

1) Mention four features of India's agriculture on the eve of information ?
2) How would you explain the drain of wealth during the British rule?
3) Discuss occupational structure of Indian economy at the time of Independence ?
4) State three main features of Indian economy at the time of independence ?
5) Mention the state of Indian Industries on the eve of independence ?
6) Explain positive effects of introduction of railways by colonical Govt. in India ?

6 Marks Questions

1) What are the main causes of Indian's agricultural stagnation during the colonical period ?
2) Give a quantitaive apprasial of Indian's demographic profile during the colonial period ?
3) Critically oppraise some of the shortfalls the industrical policy pursued by the British colonical administration ?
4) Were there any positive contributions made British in India ? Discuss ?

Answer of One Mark Questions

1) Infant mountality rate means number of deaths of children below the age of one year per thousand.
2) Commercialisation of agriculture means production of crops force sale in the market rather than for self-consumption.

3) Infant mortality rate 218 per thousand.
4) Life expactancy was 32 years.
5) When export of a country is more than import .
6) 1881
7) Jute and Textile industries.
8) Prof. V.K.R.V. Rao and Dada Bhai Nauroji
9) 16%
10) 10%

FREQUENTLY ASKED QUESTIONS
INDIAN ECONOMY ON THE EVE OF INDEPENDENCE

1. What was the mortality rate of India during British Rule ?

   Hint : 18 per thousand alive births.

2. What were the two main draw backs the industrial sector during colonial rule ? 3/4 mark.

   Hints:

   i) De-industrilisation

   ii) Lopsided modern industrial structure

   iii) Capital goods industries were lacking

   iv) United operation of the public sector

3. What were the main causes of India's agriculture stangnation during the colonise period ? 6 marks

   Hints

   1) Land settlement system

   2) Commercialization of Agriculture

   3) Low level of productivity

   4) Adverse effect of partition.

1. Mention four features of India's agriculture on the eve of independence.
2. What were the objectives of the British Govt. in bringing about infra structural change it the Indian economy.
3. How would you explain the drain of wealth during the British rule.
4. Discuss occupational structure of Indian economy at the time of independence.
5. State three main features of Indian economy at the time of independence.
6. Mention the state of Indian industries on the eve of independence. 6

6 MARKS QUESTIONS

1. Critically appraise some of the shortfalls of the industrical policy pursued by the British colo-nial administration.
2. What were the main causes of India's agricultural stagnation during the colonial period.
3. Give a quantitative appraisal of India's demographic profile

during the colonial period.

4. Were there any positive contributions made by the British in India ? Discuss.

ANSWER OF ONE MARK QUESTIONS

1. Infant mortality rate was 18 per thousand.
2. Life expectancy was 32 years.

UNIT - 4

INDIAN ECONOMY (1950-1990)

Five year plans

After India attained her independence, the leaders had to decide on the kind of economic system which will suit and promote the interests of the masses of India and not just a few individuals. Nehru and the other leaders of independent India sought an alternative to the extreme kinds of capitalism and socialism practiced in the world elsewhere. They formed an economic system which combined the best of both capitalism and socialism i.e. mixed economy.

The government would plan for the economy while encouraging the private sector to be a part of the plan effort Planning Commission was set up in 1950 and the Prime Minister was its chairperson. With the setting up of the planning commission, the era of five year plans had begun.

COMMON GOALS OF FIVE YEARS PLANS

Any five year plan should have strategic and specific goals which it should aim to fulfill. The goals of the five year plans are:

- Growth
- Modernization
- Self reliance
- Equity

Growth: Growth refers to the increase in the production capacity of our country i.e production of output goods and also the increase of services within the country. This means a large stock of productive capital or a large quantity of supporting services like transport and banking or an increase in the efficiency of the productive capital and services of the country. In economics, the Gross Domestic Product (GDP) is a good indicator of the economic growth of a nation. The GDP is the market value of all the goods and services produced in a country during a year. GDP can be thought of as a bar of chocolate or piece of cake. Growth is the increase in the size of the chocolate or cake. If the chocolate or cake is bigger, more people can have and enjoy it. In the words of the first five year plan, it is necessary to produce more goods and services if the people of India are to enjoy a more rich and varied life. The different sectors of the economy, namely the agricultural sector, the service

sector and the industrial sector are considered when the GDP is derived. The structural composition of the economy is the contribution made by each of these sectors. The contribution of each sector differs from nation to nation, while in some the contribution by the service sector is more, in some the contribution by agriculture is more.

Modernization: In order to increase the production of goods and services, the producers have to use new technology. Adoption of new technology is modernization. For example, farmers can use a new hybrid seed variety instead of the old ones to increase crop yield. Modernisation just not refer to just adoption of new technology, it also refers to changes in the thinking and social outlook of the people of our country. Giving equal rights to women is an example of modernization. In a traditional society, women are restricted to do only household chores, whereas in a modern society they are given opportunities to work in all the sectors like banking, schools, factories etc. This kind of modernization makes a society more civilized and prosperous.

Self Reliance: The economic growth and modernization of a nation can be promoted in two ways:

1. Using resources imported from other nations.

2. Using its own resources The first seven five year plans stressed and gave a lot of weightage to self reliance meaning avoiding import of goods which can be produced in our country itself. This policy was considered essential in a bid to reduce our dependence on other nations, mostly for food. A newly independent nation would obviously stress on the need for self reliance. It was also feared that a dependence on foreign nations would make our sovereignty vulnerable.

Equity: All the above three mentioned goals by themselves would not lead to the betterment of the standard of living of the people of a nation unless there is equality. If modernization, growth and self -reliance does not reach the poorer sections of a country, then only the rich would enjoy the benefits of economic prosperity. So apart from modernity, growth and self-reliance, every Indian should be able to meet his or her basic needs like food, clothing, housing, education and healthcare. Inequality in the distribution of wealth and economic prosperity had to be reduced.

AGRICULTURE

In 1951, about 59 percent of national income was generated in the agriculture sector. About three-fourths of India's total population found their livelihood in agriculture. During the colonial rule, there was neither growth nor equity in the agriculture sector. Therefore planners gave top priority to the agriculture sector.

Role of agriculture sector

1. Share in national income
2. Share in employment
3. Basis of industrial development
4. Importance of foreign trade
5. Importance in household consumption.

Problem of Indian agriculture

Indian agriculture face a number of problems which are stated below:

Problems of Indian Agriculture

General problem	Institutional Problems	Technical problems
1. Social Problem	1. Defective tendancy of reforms	1. Obsolete techniques of production
2. Pressure of population of land	2. Lack of credit and marketing facilities	2. Cropping pattern
3. Subsistence farming	3. Size of holdings	3. Lack of irrigation facilities
4. Land degradation		
5. Crop losses		

- Agriculture policies and programmes during 1950-90

AGRARIAN REFORMS

Land Reforms	Technological Reforms	General Reforms
1. Abolition of intermediaries	1. Use of HYVS	1. Expansion of irrigation facilities
2. Regulations of rent	2. Extensive use of fertilizers	2. Institutional Credit
3. Land Ceiling	3. Use of Pasticides	3. Improvement in agriculture marketing
4. Consolidating of holding		4. Price support policy.
5. Cooperative farming		

Green Revolution

The new agricultural strategy was put into practice for the first time in India in the kharif season of mid-sixty. This was termed as 'High-Yielding Varieties programme' as the basic element of this strategy was the application of HYVS. The programme was introduced in the form of a 'Package Programme.

PHASES OF GREEN REVOLUTION -

a) First Phase - mid 1960 s upto mid 1970s
b) Second Phase - mid 1970 s upto mid 1980 s

Features of Green Revolution

1. Use of high yielding varieties of seeds.
2. Application of fertiligers.
3. Adequate irrigation facilities
4. Application of pasticides.

Effects of Green revolution

1. Attaining marketable surplus
2. Buffer stock of food grains
3. Benefits to low income groups

Drawbacks of Green revolution

1. Confined of food crops
2. Limited courage.
3. Inequality among farmers.

Subsidies to the farmer

It means supply of certain inputs to the farmers at lower than the market rate.

In favour of subsidies

1. Most farmers in India are poor and will not be able to afford the required inputs without subsides.
2. Elimination of subsidies will increase the inequality between rich and poor farmers.

Against the subsidies

1. The purpose of subsidies has been served so it should be phased out.
2. Subsidy does not benefit the target group it only benefit the farmers in the prosperous regions

Industry

Importance of Industry

1. Employment generation
2. Development of agriculture
3. Exoplotations of resources
4. Productivity of labour
5. High potential for growth
6. Key of high volume of exports
7. Leads to self - substaining development
8. Promote regional balances.

Industrial policy of a1956

1. Classification of Industries – This policy classified industries into three catagories.
   a) The first category included 17 industries which would be exclusively owned by the state.
   b) The second category included 12 industries in which the private sector could supplement the effort of the state. But the state takes the sole responsibility for starting new units.
   c) The third category consisted of the remaining industries which were to be in the private sector.
2) Industrial Licensing – Private sector was kept under state control through a system of licnese. No new industry was allowed unless was obtained from the goverment.
3) Development of small scale industries.
4) Emphasis of industrial place.
5) Technical Education and training.

Role of Public sector

1. Creation of strong industrial base.
2. Development of infrastructure.
3. Development of backward areas.
4. To mobilise saving and earn foreign exchange.
5. To prevent concentration of economic power.
6. To promote equality of income and wealth distribution.

7. To provide employment.
8. To promote import substitution.

Role of Small Scale Industry

1. Labour intensive technique.
2. Self employment
3. Less capital intensive.
4. Low import
5. Export promotion
6. Equal distribution of income
7. Descentralisation of industries.
8. Seed beds for large scale industries.
9. Substaining agricultural development.

Problems of Small Scale Industry

1. Problem of finance
2. Shortage of raw material
3. Difficulty of marketing
4. Outdated machines and equipments
5. Underutilised export potential
6. Bureaucratic hurdles
7. In competition from large scale industries.

TRADE POLICY : IMPORT SUBSTITUTION

Indian adapted import substitution policy for a large part of the period 1950-90. The policy of import substitution is commonly called an Inward looking trade strategy. Government made use of two ways to protect goods produced in India from imports –

a) Tariff – It refers to taxes leved on imported goods.

b) Quotas – It refers to facing the maximum limit on the imports of a commodity by a domestic producer.

- **REASON FOR IMPORT SUBSTITUTION.**
  1) Industries of developing countries, like India are not in a position to compete against the goods produced by more developed economics.
  2) To save scarce foreign exchange for the import of essential goods.
- **1 Marks Question**
  1. Define green revolution.
  2. What is market surplus.
  3. Define small scale industry.
  4. In which year, India adopted High yielding varieties programme for the first time.
  5. In 1951, agriculture contributed to country's national income.
  6. In which year, the second Industrial policy in India was declard.
  7. Industrial policy resolution classified industries into –
     a) 2 b) 3
     c) 4 d) 5
  8. Green revolution is most successful in
     a) Wheat and rice b) Wheat and potato
     c) rice and coffee d) Rice and tea
- **3/4 Marks Question**
  1. Discuss any three drawbacks of green revolution.
  2. Discuss the role of small scale industries in the generation of employment.
  3. Give three reason why small scale industries should be encouraged in India.

4. Why there was a need for protection of small scale industries? State the steps undertaken by the government for their growth.
5. How were the industries classified according to IPR 1956.
6. Define Green revolution? Why was it implemented and how did it benefit the farmers ?
7. Explain any three problems of Indian agriculture ?
8. What do you mean by planning goal of self reliance.

- **6 Marks Question**

1. Critically appraise the development of agriculture between 1950 and 1990 .
2. Explain the main features of the Industrial policy 1956.
3. Explain the problems of small scale Industry.
4. Explain any four objectives of planning commities.

- **HOTS**

1. "Subsidies put a huge burden on the government's finnances, but are necessary for poor and marginal farmers" Comment.
2. Explain how import substitution can protect domestic industry.

- **One mark answer**

1. Green revolution refers in the tremedous increase in agriculture production and productivity with the introductice of new technology.
2. Marketing surplus means production sold in the market after salf consumption.
3. SST in presently defined as the one whose inne does not excuses rs 5 score.
4. 199-67
5. 55-56%
6. 1956
7. (b) - 3
8. (a)
9. NITI AAYOG

FREQUENTLY ASKED QUESTIONS
INDIAN ECONOMY 1950-1990

1. Who formulates plans in India ?

   Hint : Planning Commission.

2. What were the limitation of green revolution

   (i) Restricted to limited crops and areas.

   (ii) Partial removal of poverty

   (iii) Differential gains

   (iv) Rise in employment was not upto mark

   (v) Some other harmful effects.

3. How were the industries classified according to the industrial policy resolution 1956. (6 Marks) Hints

   (i) Schedule A - 17 industries under the exclusive responsibility of state.

   (ii) Schedule B-12 industries under the responsibility of state but private sector units would be allowed to expand existing units.

   (iii) Schedule C-Other residual industries left open to the private sector.

ECONOMIC REFORMS SINCE 1991

Since independence, India followed a mixed economic structure which combined the advantages of both the socialist and capitalist economies. The inefficient management of the Indian economy in the 1980s lead to the financial crisis. The government generates funds through taxation, running of public sectors etc in order to implement various policies and for the general administration. Hence, The Indian Government has introduced many Economic Reforms in India since 1991.

- **NEED OF ECONOMIC REFORMS**

  In 1990-91 India had to face grave economic problem. During the year 1991, India was faced with an economic crisis because of her external debt. The government was not able to repay the money it had borrowed from abroad..

  - India was facing serious deficiency in her foreign trade balance and it was increasing.
  - Since 1987-88 till 1990-91 it was increasing in such a rapid scale that by , the end of 1990-91 the amount of this deficit balance became 10,644 crores of rupees..
  - At the same time the foreign exchange stock was also decreasing.
  - In 1990 and 1991 the government of India had to take huge amount of loan from the IMF as compensatory financial facility.
  - Even by mortgaging 47 tons of gold it had taken short term foreign loan from the Bank of England.
  - At the same time, India was also suffering from inflation, the rate of which was 12% by 1991.
  - The reasons of that inflation were the increase in the procurement price of the agricultural products for distribution, the increase in the amount of monetized deficit in the budget, increase of import cost and decrease in the rate of currency exchange and Administered price like.
  - Thus India was facing trade deficit as well as Fiscal Deficit. Hence the government of India had only two ways before it-

  1. To take foreign debt and to create favorable conditions within the country for increasing the flow of foreign exchange and also to increase the volume of export.

2. The other was to establish fiscal discipline within the country and to make structural adjustment for the purpose.

- **MAIN FEATURES OF ECONOMIC REFORMS**

To get relief from such a grave problem the government of India had to introduce a package of reforms which included:

- To liberalize the industrial policy of the government.
- To invite foreign investment by privatization of industries.
- Abolishing the license system as a part of that liberalization.
- To make the import-export policy of the country more liberal and so that the export of Indian goods may become more easy and the necessary raw materials and instruments for both industrial development and production of exportable commodities may be imported and also to facilitate free trade by reducing the import duty.
- To decrease the value of domestic currency rupees in terms of dollar i.e. devaluation.
- To take huge amount of foreign debt from the IMF and the World Bank for rejuvenating the economic condition of the country and to introduce the structural adjustment in the economic condition of the country as a pre-condition of that debt,
- To reform the banking system and the tax structure of the country and
- To establish market economy by withdrawing and restricting government interference on investment.

LIBERALISATION, PRIVATISATION; AND GLOBALISATION (LPG) POLICIES

The new model of economic reforms is commonly known as the LPG or Liberalization, Privatization and Globalization model. The primary objective of this model was to make the economy of India the fastest developing economy in the globe with capabilities that help it match up with the biggest economies of the world.

I. Liberalization: Liberalization refers to a relaxation of government restrictions, usually in such areas of social, political and economic policy. The economic liberalization in India denotes the continuing financial reforms which began since July 24, 1991.

2. Privatization: Privatization refers to the participation of private

entities in businesses and services and transfer of ownership from the public sector (or government) to the private sector as well.

3. Globalization: Globalization stands for the integration and consolidation of the various economies of the world. Given below are the salient highlights of the Liberalization, Privatization and Globalization Policy in India:
   - Foreign Technology Agreements
   - Foreign Investment • MRTP Act, 1969 (Amended)
   - Industrial Licensing Deregulation
   - Beginning of privatization and disinvestment
   - Opportunities for overseas trade
   - Steps to regulate inflation
   - Tax reforms • Financial sector reforms
   - Banking reforms • Abolition of License -Permit Raj

- **AN APPRAISAL OF LPG POLICIES**

The concepts of liberalization, privatization and globalization are actually closely related to one another. The advent of globalization as a result of liberalization, privatization and globalization has both positive and negative impacts on our economy.

While one group of people argue that globalization provides greater opportunities, opens up new markets, promotes the use of better technology and increases the efficiency of production.

Another group of people feel it does not protect the domestic industries particularly in developing nations. From India's perspective, globalization has improved our conditions of living and opened up employment in fields like entertainment, IT, telecommunication, travel and hospitality.

Positive impacts	Negative impacts
1. High economic growth rate	1) Marginalization of agriculture
2. Increase in Foreign investment	2) Jobless economic growth
3. Increase in forex reserve	3) Unequal income distribution '
4. Controlled inflation	4) Profit oriented society .
5. Changes in export structure	5) Negative impacts of privatization
6. Changes in export direction	6) Over exploitation of natural resources
7. Establishment of consumer sovereignty	7) Environmental degradation

ECONOMIC REFORMS SINCE 1991

- **1 mark Questions**
  1. When was economic reforms introduced in India?
  2. What do you mean by liberalization?
  3. What is privatization?
  4. Define the globalization?
- **3 & 4 mark Questions**
  1. Describe the economic reforms undertaken in 1991.
  2. What were the needs of economic reforms for India?
  3. What are the main features of economic reforms?
  4. Give any three features of 'LPG - Policy'.
  5. Write the 3-4 positive and negative impacts of LPG policy.
- **6 mark Questions**
  1. Why were reforms introduced in India in 1991?
  2. Explain the changing role of the state in the Indian economy since 1991.
  3. Explain the steps taken by economic reforms towards

  a) liberalisation

  b) privatisaiion

  c) globalization
  4. Evaluate the positive and negative impacts of LPG policy
- **Answer of one mark question**
  1. In 1990
  2. It refers the rularation of government ristrictions.
  3. It is the process that transfer of ownership from the public sector to the private sector.
  4. It refers to the integrator of the various economics of the world.

FREQUENTLY ASKED QUESTIONS
INDIAN ECONOMY 1950-1990

1. When was new economy policy announced ? 1 marks

   Hints : July 1991

2. What are the objective of WTO ? 4/3 marks

   Hints

   (i) To develop integrated and durable trading system.

   (ii) To reduce tariff and non-tariffbarrier.

   (iii) To ensure linkages between trade policies, environmental policies and sustainable development.

   (iv) To raise the standard of living.

3. Mention any three causes, which were responsible for economic reforms. 6 Marks

   Hints

   (i) Poor performance of public sector.

   (ii) Adverse in balance of payment.

   (iii) Huge burden of debts.

   (iv) Fall in foreign exchange reserves.

UNIT-5
(POVERTY)

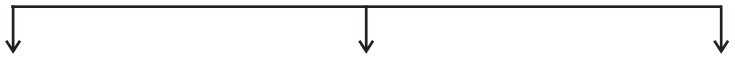
Important Points

- Poverty is the inability to fulfil the minimum requirement of life food, clothing, housing, education and wealth.

A - Relative Poverty	B - Absolute Poverty
It refers to poverty of people in comparison to other people, region or nations.	It refers to total numbers of people living below the poverty line.

- People who are always poor are known as chronic poor.
- People who regularly move in and out of poverty line is known as transient poor.
- People who live above the poverty line are known as non poor.
- Poverty line refers to that line which express per capita average monthly expenditure incurred by the people to satisfy their minimum needs.
- **Estimation of poverty line**
  a) Calories based estimation – For rural area intake calorie was estimated at 2400 and for urbans area it is 21,00 calories.
  b) Per capital expenditure based – In India, persons who spend more than ₹ 1000 in urban and ₹ 816 in rural are treated as non poor.

Three approach of govt. to combat poverty



Enhancing Economic Growth	Specific programmes for poverty alleviations	Fulfilling Minimum Needs of the poor

- **Causes of poverty**
  1) Low rate of growth
  2) Rise in population

3) Unemployment

4) Inflation

- **Measures adopted by the Government to remove poverty.**
  1) Food for work programme.
  2) Swarnjayanti Gram Swarozgar Yojna.
  3) Pradhan Mantri Gramodaya Yojna
  4) Mahatma Gandhi National Rural Employment Guarantee Act
- **1Mark Questions**
  1) Define poverty
  2) Define poverty line
  3) Write two programme to solver poverty
  4) How does absolute poverty measured in India
  5) National rural guarantee act, 2005 ensures for ..... days of employment in a year in rural areas.
  6) Which states are the most poor?
- **3/4 marks questions**
  1) What is meant by poverty? Distinguish between absolute and relative poverty.
  2) Briefly explain the three approaches adopted by the India Government to combat poverty.
  3) Explain how rapid growth in population spreads poverty.
  4) Comment on 'MGNREGA'.
  5) How inequalities of income are responsible for poverty?
  6) Explain the three main causes of poverty in India.
- **6 marks questions**
  1) Briefly explain the three dimensional attack on poverty adopted by the government.
  2) Is there any relationship between unemployment and poverty?
  3) Give the critical assessment of poverty alleviation programmes.
  4) Explain briefly the causes for poverty.

- **Answer of one mark questions**

  1) It refers the situation where people do not fulfil the minimum needs of life.
  2) Poverty line refers to that line which express per capital average monthly expenditure incurred by the people to satisfy their minimum needs.
  3) i) Food For Work
     ii) MGNREGA
  4) Absolute poverty is measured in India with the help of poverty line.
  5) 100 days
  6) Odisa, West Bengal, U.P. and Bihar

HUMAN CAPITAL FORMATION IN INDIA

- Human Capital refers to the stock of knowledge, skills, ability, education, motivation and health in a nation at a point of time.
- Human capital formation is the process of acquiring and increasing among the people of the country over a long period of time.
- **Sources of human capital for motion :–**

  1) Expenditure on education
  2) Expenditure on skill development
  3) On the job training
  4) Expenditure on Migration
  5) Expenditure on health
  6) Expenditure on information
- **Problems facing human capital formation in India :–**

  1) Pressure of rapidly growing population
  2) In-edequate resources
  3) Problem of Brain-Drain
  4) Lack of proper management of human resources
  5) Lack of quality education of technical and management

6) In-edequate development of health services

- **Role of human capital in economic development of a country :–**
  1) Increasing skill and the level of productivity
  2) Bring positive change in attitude and behaviour
  3) Increasing research and technical reforms
  4) Raises life expectancy
  5) Raises the level of life-standard
- **Role of education in human development :–**
  1) Raise creativity and productivity of the people
  2) Education produces good citizens
  3) Develops science and technology
  4) Helpful in proper civilization of resources of the country
  5) Expands mental horizon of the people
  6) Develop skills among the people
- **Human capital formation in India :–**
  1) Human capital formation is the goal and factor of economic development. Human resource development is included in the directive principles of the state in India.
  2) In India, ministry of education at the centre and state level. NCERT (National Council of Educational Research and Training), UGC (University Grant Commission), AICTE (All India Council of Technical Education) regulate the education sector.
  3) In India, Ministry of Health at the union and the state level and ICMRC (Indian Council of Medical Research) regulate the health sector.
  4) Provision of drinking water and sanitation facilities are the basic needs of healthy life. State Governments and local bodies are responsible to provide such facilities.
- Growth of Education Sector in India :– Education is the main factor of the social and economic development of a country. A good education system produces not only skilled and trained people but also promotes science and technology. The following

observations highlight the growth of education sector in India :–

1) Elementary Education :–
   a) Elementary education includes primary and middle school education.
   b) In 1950-51, the number of primary and middle schools were 2.23 lakh. Which increased to 12.96 lakh in 2010-11.
   c) Now, elementary education is free and compulsory (Class 1 to 8) for the age group of 6–14.
   d) Various policies such as Sarva Shiksha Abhiyan, Mid-day Meal Scheme, district primary education programme, right to education have been playing major role in enhancing primary education in India.
2) Secondary and Senior Secondary Education :–
   1) In 1950-51, there were 7400 Secondary Schools with 14.8 lakh students. In 2009-10, the number of schools rose to 1.90 lakh with 441 lakh students.
   2) For the expansion of secondary education, the following institutions are working :–
      a) Navodaya and Kendriya Vidhayalayas
      b) National Council of Educational Research and Training
   3) Higher Education :–
      1) Universities, Colleges, Professional and Technical Educational in situations are included in higher education.
      2) After Independence, there has been a lot of development in the field of higher education in the country. As many as 749 (as on 31st March, 2016) universities are providing higher education in the country of these, there are 46 central universities, 345 state universities, 123 deemed universities and 235 private universities. Besides, there are about 37204 (2012-13) colleges in the country.
      3) The following main institutions are working in the

field of higher education :–

a) University Grant Commission (EGC)

b) Indira Gandhi National Open University (IGNOU)

c) All India Council for Technical Education (AICTE)

d) Indian Council for Medical Research (ICMR)

- Problems related to development of education in India :–

1) Large number of illiterates

2) Inadequate Professional and Technical Education

3) Gender Bias

4) Low Rural Access Level

5) Low government expenditure on the development of education

- 1 Mark Questions

1) ..... five year plan recognised the importance of Human Capital.

a) Second b) Eight

c) Seventh d) Third

2) In India, which of the following organisation regulate the health sector?

a) UGC b) AICTE

c) ICMR d) None of the above

3) As per census roll, literacy rate in India is about :–

a) 56% b) 80%

c) 74% d) 65%

4) Which one of the following is a reason for poor human capital formation in India?

a) Brain-Drain b) High growth of population

c) Insufficient resources d) All of the above

5) What do you mean by human capital for motion ?

6) What is on the job training?

7) Why do we need to invest in human capital?

- **3/4 Marks Questions**

1) What are three major sources of human capital formation?
2) Explain the concept of human capital formation.
3) Bring out the differences between human capital and physical capital.
4) Is rapidly growing population a constraint in the process of human capital formation? Explain.
5) Explain how educational planning is necessary for human capital formation?
6) What are the principle objectives of education in India?
7) How is health a source of human capital formation?
8) How migration promotes human capital formation?
9) Explain how investment in education stimulates economic growth.
10) Trace the relationship between human capital and economic growth.

- **6 marks questions**

1) What is human capital formation? Differentiate between human capital and physical capital.
2) How does investment in human capital contribute to economic growth?
3) What are the sources of human capital formation.
4) What is the need for government intevention in promoting health and education in India?
5) How does expenditure on "on the job training and "Information" act as a source of human capital.
6) Explain the growth of education sector in India?
7) Explain how education is still a challenging preposition in India?
8) Discuss the need for promoting women's education in India.

HOTS :

1) 'There is a downward trend in inequality world wide with a rise

in the average education levels; comment.

2) How does human capital formation raise social justice?

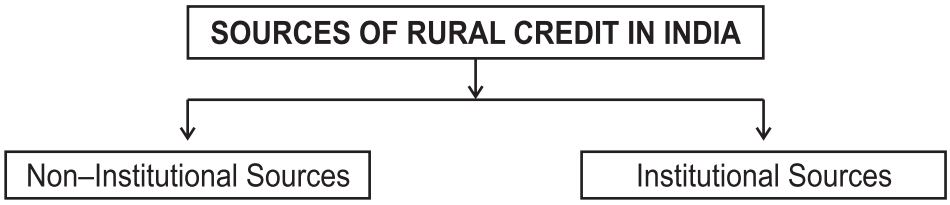
- **Answers of one mark questions**

1) C
2) C
3) C
4) D
5) Human capital formation is the process of acquiring and increasing the abilities, skills, education and experience among the people of the country over a long period of time.
6) On the job training refers to the training providing to the workers by the firm to enhance their specialized skill. It makes them more efficient and productive.
7) Because it develops man's ability and skill.

RURAL DEVELOPMENT

- Rural Development is a process of improving the standard of life and social economic welfare of the people living in rural areas.
- **Key Issues in Rural Development :–**

1) Raising agricultural productivity per unit of land.
2) Improving agricultural marketing system that ensures remunerative price to the former for his produce.
3) Motivate the production of higher value crops.
4) Motivate agricultural diversification.
5) Diversification of production activity with a view to find alternative means of sustainable living other than crop-cultivation.
6) Provision of credit facilities in the rural areas.
7) To reduce the level of poverty in rural areas by farm and non-farm employment.
8) Promotion of organic farming.
9) To expand education and health facilities in rural areas.



I) Non–Institutional sources :–

It includes money lenders, traders, commission agents, landlords, relative and friends.

II) Institutional sources include :–

1) Co-operative credit socities
2) SBI and other Commercial Banks.
3) Regional Rural Banks.
4) NABARD (National Bank for Agriculture and Rural Development)
5) Self Help Groups

- The term agricultural marketing includes all those activities which are mostly related to gathering, processing, grading, packaging, storing, transporting and selling the agricultural produce.
- **Defects of Agricultural Marketing**
  1) Inadequate storage facility.
  2) Inadequate means of transport and communication.
  3) Malpracties in a regulated markets.
  4) Multiplicity of middlemen.
  5) Lack of proper grading.
  6) Lack of adequate institutional finance.
  7) Lack of proper marketing facilities.
- Measures adopted by the government to improve marketing system :–
  1) Regulated markets.
  2) Provision of warehousing facilities.
  3) Compulsory use of standard weights for measurement.
  4) Subsidised transport.

5) Establishment of food corporation of India (FCI), central ware housing corporation etc. by the govt. to increase the capacity of storing.

6) Provision of minimum support price (MSP).

7) Dissemination of marketing information.

- Diversification in agriculture activities :– It has two aspects :–

  1) Diversification of crop production :– It refers to a system of multiple cropping rather than mono cropping. It has two advantages :–

     a) It lowers the risk of farmer on account of monsoon failure.

     b) It enhances the scope for commercialisation of farming.

  2) Diversification of productive activities :– It implies a shift of labour force from crop-farming to non-farming areas of employment, like – Animal husbandry, fisheries, horticulture etc.

- Non-farm areas of employment for rural population.

  1) Animal husbandry

  2) Fisheries

  3) Poultry

  4) Bee-Keeping

  5) Horticulture

  6) Cottage and Household Industry

- Organic Farming is a system of farming in which organic inputs (basically include animal measures and composts) are used for cultivation. It discourages the use of cultivation. It discourages the use of chemical inputs. This methods of farming is environment friendly.

- **Advantages of Organic Farming :–**

  1) Organic level of soil increase by the use of organic inputs and sustains soil fertility.

  2) Organic inputs provide minerals for the growth of plants.

  3) Organic inputs are cheap as compared to chemical inputs.

4) Organic farming is environment friendly.

5) Inexpensive technology for small farmers.

6) Organic farming is based on labour intensive technique.

7) We get heathier and tastier food by the use of organic farming.

- **1 Mark Questions**

1) Which is the apex institution to provide credit facility to agriculture and rural development :–

a) NABARD

b) SBI

c) RBI

d) National Co-operative Bank of India

2) National Rural Development institute is situated at :–

a) Haryana b) Delhi

c) Hyderabad d) Mumbai

3) When National Horticulture Mission was launched ?

a) 2001-02 b) 2010-11

c) 2005-06 d) 2014-15

4) Which of the following is not related to agricultural marketing :

a) Storage b) Gathering

c) Processing d) Use of chemical fertilizers

5) What is rural development.

6) When was NABARD established?

7) What is agricultural marketing.

8) What do you mean by organic farming?

- **3/4 Marks Questions :**

1) Write a short note on NABARD.

2) Why does Indian Farmer need credit?

3) Explain the importance of self help groups (SHGS) in rural areas.

4) Explain three steps taken by the government in developing

rural market.

5) What are the advantages of organic farming.

6) Explain three non-farm areas of employment for rural population.

7) Give three basic objectives of co-operative credit socities.

8) Explain three defects of agriculture of marketing

9) Write a short note on –

   a) MSP (Minimum Support Price)

   b) Buffer Stock

   c) PDS (Public Distribution System)

10) Why is agricultural diversification essential for sustainable livelihoods.

- 6 Marks Questions

1) What is rural development? What are the key issues of rural development?

2) What are the sources of rural credit in India?

3) What steps have been taken by the government to improve agricultural market system in India?

4) What do you mean by agricultural diversification? Why is it required?

5) What do you mean by organic farming. Why should we adopt organic farming?

- **HOTS :**

1) What are the alternative channel is available for agriculture marketing? Give some examples.

- **Answer of one mark questions :**

1) A

2) C

3) C

4) D

5) Rural Development is a process of improving the standard of life and social economic welfare of the people living in rural

areas.

6) 1982

7) Agricultural Marketing includes all those activities which are mostly related to gathering, processing, grading, packaging, storing, transporting and selling the agricultural produce.

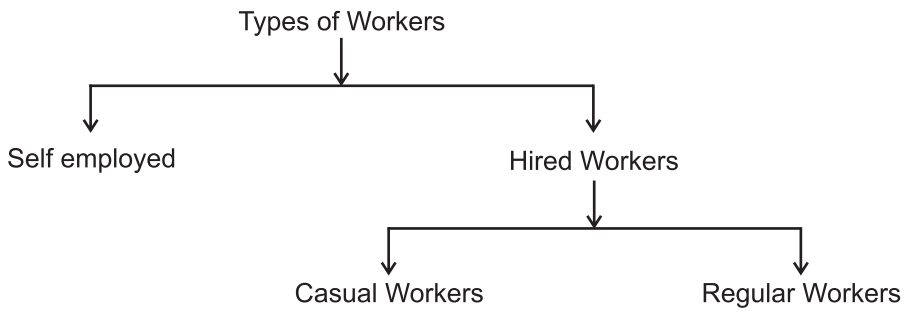
8) Organic farming is a system of farming in which organic inputs (basically include animal measures and composts) are used for cultivation. It discourages the use of chemical inputs.

EMPLOYMENT : GROWTH, INFORMALISATION AND OTHER ISSUES

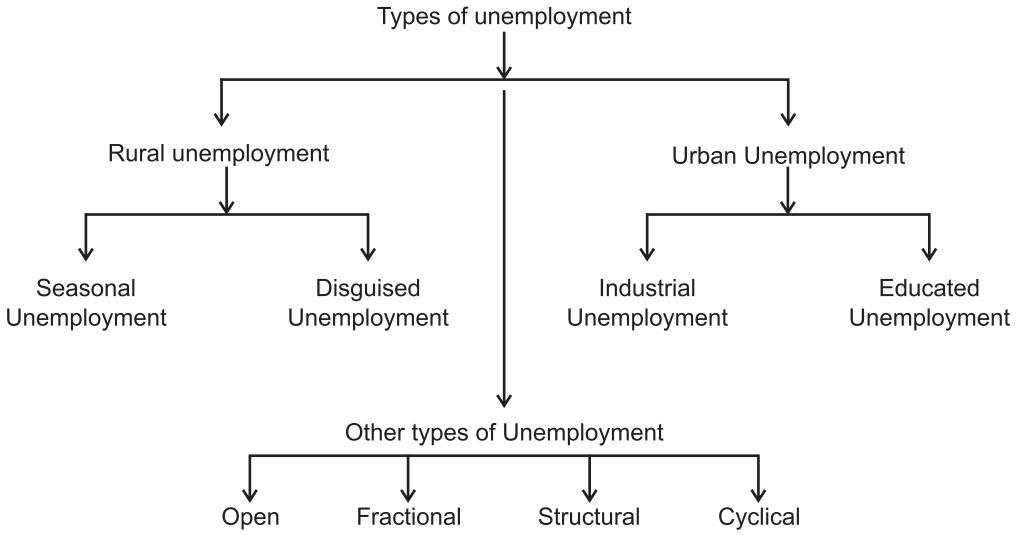
Point to remember

- Work plays an important role in our lives, as individuals, and as members of society.
- A worker is an individual, who is involved in some productive activity, to earn a living.
- Production activity : It refers to all those activity which are under taken to produce goods and services for generation of income.
- Labour Force :– All persons, who are working and those are not working but able to work and willings to work at the existing wage rate constitute labour force.
- Work Force :– The number of persons, who are actually employed at a particular time are known as workforce. It includes all those persons who are actually engaged in productive activities.

$$\text{Participation Rate} = \frac{\text{Work Force}}{\text{Total Population}} \times 100$$



- Labour Supply :– It refers to various amount of labour that people are willing to offer corresponding to a different wage rate. It is estimated in terms of man an days of work. One man days refers to 8 hours of work.
- About two fifth of the total population in the country is engaged in various economic activities. Men particularly rural mens form the major section of workforce in India.
- Majority of workers in India are self employed, casual wage labourers and regular salaried employees together account for less than half the proportion of India's workforce.
- About three fifth of India's workforce depends on agriculture and other allied activities as the major source of livelihood.
- Jobless Growth :– It is defined as a situation where GDP grows faster than the employment opportunities resulting in unemployment.
- Casualisation of employments :– Casualisation refers to a situation when the percentage of casually hired workers in the total workforce tends to rise over time.
- Informalisation :– Refers to a situation when people tend to find employment move in informal sector of the economy and less in formal sector of the economy.
- Unemployment :– It is a situation where a person is ready and willing to work at the prevailing wage rate but doesn't get work.



- Causes of unemployment :–
  1) Slow rate of economic growth
  2) Population explosion
  3) Defective education system
  4) Underdeveloped agriculture
  5) Slow growth of Industry
  6) Decline of cottage and small Industry
  7) Inadequate employment planning
  8) Low capital formation
- Remedial measures of unemployment :–
  1) Accelerating growth rate of GDP
  2) Control of population growth
  3) Development of Agriculture sector
  4) Development of small scale enterprises
  5) Encouragement in infrastructure
  6) Special employment programmes
  7) Rapid Industrialisation
- Special programmes to fight poverty and unemployment :–
  1) Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA)
  2) Swarnjyanti Sahari Rozgar Yojna
  3) Pradhan Mantri Gramodaya Rozgar Yojna
  4) Swarnjyanti Gram Swarozgaar Yojna
- **One Mark Questions**
  1) Who is worker?
  2) Define GDP?
  3) What is workforce?
  4) Define Participation Rate?
  5) Define Jobless Growth?
  6) Define Casualisation of employment?
  7) Give the meaning of disguised unemployment?

8) Who is casual wage labourer?

9) Define self employed workers?

10) What is informalisation of work force?

- **3/4 Mark Questions**

1) Analyse the recent trends in sectoral distributing workforce in India?

2) What is the difference between labour force and work force?

3) What are the adverse effects of unemployment?

4) Suggest general measures to control unemployment?

5) Give a brief note on the MNREGA?

6) Empowerment of women is related to employment of women. Comment.

- **6 Mark Questions**

1) What are the various types of unemployment?

2) What are the causes of unemployment?

3) Explain occupational structure of workforce?

4) What do you mean by organised sector? Discuss the reasons for fall in employment in organised sector?

- **Answer to one mark questions**

1) A worker is an individual who is doing some productive employment to earn a living.

2) Sum of the goods and services produced in the economy during a year is called GDP.

3) The number of persons, who are actually employed at a particular time are known as workforce.

4) Participation rate is defined as the percentage of total population which is actually participating in productive activity.

5) Jobless growth is defined as a situation in which there is an overall acceleration in the growth role of GDP in the economy which is not accompanied by a commensurate expansion in employment opportunities.

6) Casualisation of employment is defined as a situation in

which percentage of casually hired workers in the workforce tends to grow overtime.

7) Disguised unemployment refers to a state in which more people are engaged in work that are really needed.

8) Workers who are not hired by their employers on a regular or permanent basis and do not get social security benefits, are formed as casual wage labour.

9) Self employed workers are those who work in their own business or profession and get profit as their reward.

10) Informalisation of work force refers to a situation where by the proportion of work force in the informal sector to total workforce increases.

INFLATION : PROBLEMS AND POLICIES

Inflation means a state in which there is persistent increases in the price level in an economy. It leads to fall in the value of money. In the situation of inflations prices of all the goods are not going to increase, but prices of many goods decreases too. The opposite of inflation is "Deflations".

There are two types of inflation (i) Demand pull inflation (ii) Cost push inflation

1) Demand pull inflation :– Demand pull inflation occurs when the aggregate demands for good and services exceeds their available supply.

- Causes of demand pull inflation :–
  - Increase in supply of money
  - Rapid growth in population
  - Increase in Govt. expenditure
  - Growth in black money
  - Credit expansion

2) Cost push inflation :– It occurs when prices rise due to increase in cost of production of goods and services. It may leads to decrease in supply of goods or services.
   - Fall in production

- Rise in wage rate
- Rise in Administered Prices
- Higher taxes
- Oil prices hike

- **Effects of Inflation / Inflation as problems :–**

1) Inflation Hinders the process of growth.
2) Purchasing capacity decreases, leads to increase in poverty.
3) It leads to hoarding & black marketing.
4) Decrease in quality of life and standard of living.
5) Increase the project cost.

- **Policy to Control Inflation :–**

a) Fiscal Policy
   - Control on public expenditure
   - Increase in tax rate
   - Increase in public borrowing
   - Control on deficit financing

b) Monetary Policy :–
   - A check on supply of money
   - Increase in rate of interest
   - Decrease in supply of credit

c) Other measures :–
   - Regulation of prices and rationing
   - Check on Hoarding & Black Marketing
   - Increase in Import
   - Controlling money wages

- **1 Mark Questions :**

1) Inflation implies :–
   a) A state of high prices of goods or services
   b) A state of rising prices of goods and services
   c) A state in which value of money rises
   d) None of these

2) In India, Inflation is measured by the Index.

a) Consumer Price Index b) Wholesale Price Index

c) Retail Price Index d) Market Forces

3) The CPI based inflation was introduced in

a) 2010 b) 1995

c) 2000 d) 2001

4) Define Inflation.

5) What is inflation rate.

6) Who controls or monitors monetary policy in India.

7) What is demand pull inflation.

8) What is cost push inflation.

- **3/4 Marks Questions :**

1) What are the major impact of inflation on the economy?

2) As inflation increases, poverty also increases. Do you agree? Comment.

3) Explain fiscal policy measures to control inflation.

4) How followings are affected in inflation.

a) Creditor b) Debitor

c) Salary Person d) Business Man

- **6 Marks Questions :**

1) Explain the main causes of inflation

2) Explain some measures taken by govt. to tackle inflation

HOTS :

1) Some inflation plays the role of tonic for economy? Comment.

2) Explain the situations in which inflation is not being controlled inspite of steps taken by RBI.

3) High rate of inflation adversly affect the FDI. Analyse the statement in context of Indian economy.

- **Answer to one mark questions :**

1) A

2) B

3) C

4) A persistent and appreciable rises in prices, leading to fall in purchasing power of money is called inflation.

5) Inflation rate is annualized percentage change in a general price index.

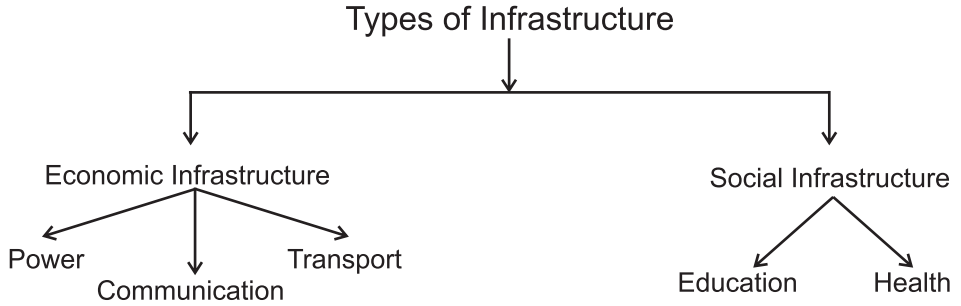
6) RBI

7) Inflation arises due to excess of demand for goods and services over their supply called demand pull inflation.

8) Inflation arises due to rise in cost of production of goods or services called cost push inflation.

INFRASTRUCTURE

Infrastructure can be defined as the supporting structure that provide different kinds of services to the main areas of production such as agricultural production, industrial production, trade and commerce.



Economical and social infrastructure together helps in the overall development of the economy. Both are supplementary and compulsory to each other.

- **Importance of Infrastructure**

  1) Facilitates functioning of the economy

  2) Agricultural development

  3) Better quality of life

  4) Provide employment

  5) Facilitates Outsourcing

- **State of Infrastructure in India**

  1) As per cencus 2001, only 56% of the rural households has electricity connection.

  2) Top water availability is limited to only 24% rural household and the remaining household make use of water from open sources.

  3) India invests only 5% of its GDP on infrastructure which is for below that of China and Indonesia.

- **Energy**

  It plays a crucial role in the development of an economy. There exist a positive correlation between economic growth and demand for energy.

- **Source of energy**

  1) Commercial energy – Commercial energy refer to those sources of energy which command a price and the users have to pay a price for them.

  2) Non-commercial energy – It consists of those source of energy which generally do not command a price.

  3) Conventional sources – These sources are beings used since long. These source of energy are limited.

  4) Non-Conventional Sources – These are the new sources of energy. These sources of energy are in abundance.

- **Sectoral Pattern of Consumption of Commercial Energy**

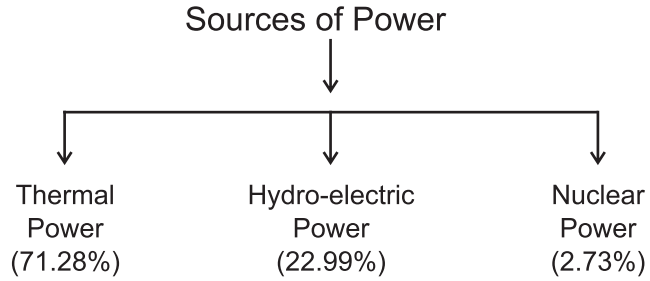
  1) Industrial sector has the largest share of 45% of total consumption of commercial energy. But the share of industries in the total utilisation of power has come down from 62.6% in 1950-51 to 45% in 2012-13.

  2) There has been continuous increase in the share of household sector (22%) and agriculture sector (18%)

  3) Commercial energy consumption make up about 65% of the total energy consumed in India. This includes coal with the largest share of 55% followed by oil at 31% natural gas at 11% and hydro energy at 3%.

- **Power**

  Power is the most critical component of infrastructure.



- **Emerging challenges in the power sector.**
  1) Inadequate generation of electricity
  2) Low plant load factor
  3) Losses of electricity boards
  4) Slow progress in the development of nuclear power
  5) Shortage of inputs
  6) Uncertain role of private players
  7) Lack of public cooperation
- **Suggested measures to meet power crisis**
  1) Improvement in plant load factor
  2) Increase in production capacity
  3) Effective control over transmission and distribution losses
  4) Encourage privatisation and FDI in power generation
  5) Uses of renewable resources
- **Health**

  Health is a state of complete physical, mental and social well-beings and not merely the absence of disease or infirmity.
- **Status of Health Infrastructure**
  1) The union through the central council of health and family welfare.
  2) At the village level, a variety of hospitals have been set up by the government.

3) Expansion of health infrastructure has resulted in the eradication of deadly diseases like small pox and the near eradication of polio and leprosy.

- **Role of Private Sector**

1) More than 70% of the hospital in India are run by the private sector.

2) Nearly 60% of dispensaries are run by the private sector.

The role of government in providing healthcare is still very important as poor people can depend only on government hospitals, due to huge expenses in private health services.

- **Community and non-profit organisation in healthcare**

One of the important aspects of a good healthcare system is community participation.

For example :–

i) SEWA in Ahmedabad

ii) ACCORD in Nilgiri

- **Medical Tourism In India**

Health services are cheaper in India as compared to cost of similar health care services in other countries. As a result foreigners come to India for surgeries, Liver transplants etc. India needs to upgrade its health infrastructure to attract more foreigners to India.

- **Indicators of Health And Health Infrastructure**

1) Expenditure on health sector is just 4.8% of total GDP.

2) India has about 7% of the worlds population but it bears a frightening 20% of the global burden of diseases.

3) Every year, around 5 lakh children die of water-borne diseases.

- **Rural Urban Divide**

1) 70% of India's population live in rural areas, but only 20% of total hospitals and 50% of total dispensaries are located in rural areas.

2) The PHCs located in rural areas do not even offer x-ray or blood testing facilities which constitutes basic health care.

There is a sharp divide between the urban and rural healthcare in India.

- **Women Health**

1) The child sex ratio declined from 945 in 1991 to 927 in 2001. It indicates growing incidence of female foeticide in the country.
2) More than 50% of married women between the age group of 15 and 49 have anaemia and nutritional anaemia, caused by iron deficiency, which has contributed to 19% of maternal deaths.

   Public Private Partnership can effectively ensure reliability, quality and affordibility of both drugs and medicare.

- **1 Mark Question**

1) Define infrastructure.
2) Define conventional source of energy.
3) What is commercial source of energy.
4) Which constitutes the maximum share in power generation.
   a) Thermal Power
   b) Hydro Power
   c) Atomic Power
   d) All the above have equal share
5) Name two sources of non conventional energy.
6) Define plant load factor.
7) Which of the following is a commercial source of energy ?
   a) Firewood
   b) Agricultural waster
   c) Coal
   d) Dried dung

- **3/4 Marks Question**

1) Distinguish between economic and social infrastructure.
2) Distinguish between commercial and non-commercial energy.
3) Short note on medical tourism in India.
4) Discuss the participation of non-profit organisation in healthcare.
5) Distinguish between conventional and non-conventional source of energy.

6) Discuss two main drawbacks of our health care system.

7) Discuss the importance of infrastructure for a economy.

8) What do you mean by transmission and distribution losses ? How could they be reduced ?

- **6 Marks Question**

1) Discuss the challenges that India's power sector is facing ?

2) Discuss the importance of infrastructure.

3) Discuss the role of private sector in providing health service in India ?

Hots

1) "Health care in India suffer from rural urban and poor-rich divide". Explain.

2) Briefly discuss the various measures needed to meet the power crisis in Inda.

- **1 Mark Answer**

1) It is the supposing system which accelerate the pall of growth.

2) These saunas are beings used since long time.

3) These saunas which command the price.

4) Thermal power

5) Solar energy, wind energy.

6) It meansuns the operational officially of thermal power.

7) Coal

SUSTAINABLE ECONOMIC DEVELOPMENT

Sustainable economic development (SED) is defined as the development that meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs. Thus, sustainable development is the organizing principle for sustaining finite resources necessary to provide for the needs of future generations of life on the earth.

Meaning : Sustainable development has been described in terms of three pillars. These are seen as "economic, environmental and social" or "ecology, economy and equity (EEE). This has been expanded by some authors to include a fourth pillar of culture.

Effects of economic development on resources

- Economics development creates a systemic collapse of natural resources.
- Economics development creates exploitation of natural resources.
- Continuous high economic growth creates unsustainable and depleted resources.
- Economic development through technological advance improve resource availability.
- Economic development creates resource substitution.

Effects of economic development on environment

- Economic development and fast growth can create negative externalities e.g. noise pollution and lower air quality arising from air pollution and road congesting.
- Economic development leads to environmental damage may lower the sustainable growth.
- Destruction of rain forest through deforestation.
- The over-exploitation of fish stocks.
- Loss of natural habitat and bio-diversity from the construction of new road, hotels, malls and industrial estates.

Global warming

Global warming is the increase of Earth's average surface temperature due to effect of greenhouse gases, such as carbon dioxide emissions from burning fossil fuels of from deforestation.

The increased volumes of carbon dioxide and other greenhouse gases released by the burning of fossil fuels, land clearing, agriculture, and other human activities, are believed to be the primary sources of the global warming.

Changes resulting from global warming may included rising sea levels due to the melting of the polar ice caps, as well as an increases in occurrence and severity of storms and other server weather events.

- **1 Mark Questions**

  1) What is meant by Sustainable Development ?
  2) What do you mean by global warming.

- **3 & 4 Mark Question**

  1) Keeping in view your locality, describe any four strategies of sustainable development.
  2) What are the factors contributing to environmental degradation in India ?
  3) Give two examples of
     a) Overuse of environmental resources.
     b) Misuse of environmental resources.

- **6 Mark Question**

  1) Explain the relevance of intergenerational equity in the definition of sustainable development.
  2) Explain the supply-demand reversal of environmental resources.
  3) Highlight any two serious adverse environmental consequence of development in India ?
  4) Outline the steps involved in attaining sustainable development in India.

- **1 Mark Answer**

  1) It is that process of development which meets the needs of present generation without reducing the ability of future generation to meet their own need.
  2) Global warming is a gradual increase in the average temperature of the earth.

UNIT-6
DEVELOPMENT EXPERIENCE ON INDIA
A COMPARISON WITH NEGIHBOUS

Points to remember :

- **Development Path Of India, Pakistan And Chian**

  i) All the three countries started their development path at the same time India and Pakistan got independence in 1947 and people's Republic of China was established in 1949.

  ii) All the three countries has started planning their development strategies in similar ways. India announced its First Five Year Plan in 1951, Pakistan announced in 1956 and China in 1953.

  iii) India and Pakistan adopted similar strategies, such as creating a large public sector and raising public expenditure on social development.

  iv) Both India and Pakistan had adopted 'mixed economy' model but China had adopted 'Command Economy' model of economic growth.

  v) Till 1980s, al the three countries had similar growth rates and per capita incomes.

  vi) Economic Reforms were implemented in China in 1978, In Pakistan in 1988 and in India in 1991.

Development Strategy :

A. China

i) After the establishment of people's Republic of China under one party rule, all the critical sectors of the economy, enterprises and land owned and operated by individuals, were brought under government control.

ii) A programme named 'The great Leap Forward (GLF) campaign was initiated in 1958, which aimed at industrializing the country on a massive scale. Under this programme, people were encouraged to set up industries in their backyards.

iii) 1965, Mao Tse lung introduced the 'Great Proletarian Cultural Revolution (1966-1976)', under which students and

professionals were sent to work and learn from the countryside (rural areas).

iv) In rural areas, commune system was started, under which people collectively cultivated lands.

v) Reforms were introduced in China in phases.

vi) In the initial phase, reforms were initiated in agriculture, foreign trade and investment sectors. In the later phase, reforms were initiated in the industrial sector.

vii) The reforms process also involved dual pricing. This means fixing the prices in two ways; farmers and industrial units were required to by and sell fixed quantities of raw materials and products on the basis of prices fixed by the government and rest were purchases and sold at market pries.

viii) In order to attract foreign investors, Special Economics Zones (SEZ) were set up, SEZ is a geographical region that has economic laws different from a country's typical economic laws. Usually the goal is to increase foreign investment.

B. Pakistan

i) Pakistan followed the mixed economy model with co-existence of public and private sectors.

(ii) Pakistan Introduced tariff protection for manufacturing of consumer goods, together with direct import controls on competing imports.

(iii) The introduction of Green Revolution and increase in public investment in infrastructure in select areas, led to a rise in the production of food grains.

(iv) In 1970's, Capital goods industries.

(v) In 1988, structural reforms were implemented. Major thrust areas were denationalization and encouragement to private sector.

(vi) Pakistan also received financial support from western nations and remittances from emigrants to the Middle countries. This helped the country in stimulating economic growth.

Comparative Study — India, Pakistan and China :

1. Demographic Indicators :

– The population of Pakistan is very small and accounts for roughly about one-tenth of China and India.

– Though China is the largest nation geographically among the three, its density is the lowest.

– Population growth is highest in Pakistan followed by India and China. One child non introduced in China in the late 1970s is the major reason for low population growth. But this measure led to a decline in the sex ratio, that is the proportion of females per 1000 males.

– The sex ratio is low and biased against females in all the three countries.

– There is strong son-preference prevailing in all these countries as the reason.

– The Fertility rate is low in China and very high in Pakistan.

– Urbanization is high in both China and Pakistan- with India having 28 percent of its people living in Urban areas.

2. Gross Domestic Product (GDP) and Sectors :

– China has the second largest GDP (PPP) of $9.4 trillion (approx) in 2013 where as India's GDP (PPP) and Pakistan GDP (PPP) are $1.877 trillion (approx) and $232.3 Billion (approx) respectively.

– On this path of Development china's average growth rate is about 9.5% while India's and Pakistan's average growth rate is about 5.8% and 4.1% respectively.

– In China, in the year 2011. with 37 percent of its workforce engaged in agriculture, its contribution to GDP is 9 percent (approx). While in India and Pakistan the contribution of agricultural sector in GDP is about 14% and 25% respectively. In India about 43% are engaged in agricultural sector, while in Pakistan this figure is about 49%.

– In china, manufacturing contributies the highest to GDP at 53' percent whereas in India and Pakistan, it is the service sector which contributes the highest (more than 50 percent of GDP)

– Though china has followed the classical development pattern of

gradual shift from agriculture to manufacturing and then to services, India and Pakistan's shift has been directly from agriculture to service sector.

– In the 1980s, India, China and Pakistan employed 17, 12 and 27 percent of its workforce in the service sector respectively. In 2011, It reached the level of 37, 37 and 35 percent respectively (approx.).

– China's growth is mainly contributed by the manufacturing sector where as in both India and Pakistan, the service sector is emerging as a major player of development.

3. Human Development Indicators :

– In most areas of human development, China has performed better than India and Pakistan. This is true for many indicators-per Capita GDP or proportion of population below poverty line, health indicators such as mortality rates, access to sanitation, literacy, life expectancy or malnourishment etc.

– Pakistan is ahead of India in reducing proportion of people below the poverty line and also its performance in transferring labour force from agricultural sector to industrial sector and access to water is better than India.

– Contrary to it, India is ahead of Pakistan is education sector and providing health services.

– India and Pakistan are ahead of China in providing improved water sources Conclusion

A India-India performed moderately as is clear from

– A majority of its people still depend on agriculture.

– Infrastructure is lacking in many parts of the country.

– It is yet to raise the level of living of more than 22% of its population that lives below the poverty line.

B Pakistan-Pakistan has performed poorly. The reasons for the slowdown of growth and re-emergence of poverty in Pakistan's economy are :

(i) Political instability.

(ii) Volatile performance of agriculture sector.

(iii) Over dependence on remittances.

(iv) Growing dependence on foreign loans on the one hand and increasing difficulty in paying back the loans on the other.

C China-China has performed comparatively the best as is clear from :

– Success in raising the level of growth along with alleviation of poverty.

– It used the market mechanism to creat additional social and economic opportunities without political commitment.

– By retaining collective ownership of land and allowing individuals to cultivate lands, China has ensured social security in rural areas.

– Public intervention in providing social infrastructure has brought about positive results in human development indicators in China.

Common Annual School Examination 2016-17
Subject: Economics

Class-XI **Marks : 80+10 (OTBA)**

General Instructions:

i) This question paper has three parts A, B and C.

ii) All questions are compulsory.

iii) Marks for questions are indicated against each.

iv) Question nos. 1 to 2 and 12 to 14 are very short answer type questions carrying one mark each. Answer to them should be in one sentence or one word each.

v) Question nos. 3 to 6 and 15 to 19 are short answer type questions carrying three marks each. Answer to them should not normally exceed 60 words each.

vi) Question nos. 7 to 8 and 20 are also short answer type questions carrying four marks each. Answer to them should not normally exceed 70 words each.

vii) Question nos. 9 to 11 and 21 to 23 are long answer type questions carrying six mark each. Answer to them should not normally exceed 100 words each.

viii) In Part 'C' of question paper there are two questions based on open text material carrying 5 marks each. Word limit about 100 words.

ix) Open text material is attached herewith.

Part-A

Marks: 80+10 (OTBA)

1. State my two features of Economic resources. 1
2. Define Index No. 1
3. What are the essential features of a good sample. 3
4. Explain any 3 characteristics of classification. 3
5. Distinguish between Karl Pearson's method of correlation and Spearmant's method of correlation. 3
6. What do you mean by lorenz curve ? What are its uses ? State any structures. 3

   or

   Calculate spearman's rank order coefficient of correlation from the following data: 3

   In a beauty contest two judges ranked the 10 participants.

Judge I	1	6	5	10	7	3	2	4	9	8
Judge II	3	5	4	8	6	10	2	1	7	9

7. Calculate the QD from the following data. 4

Marks	:	10-20	20-30	30-40	40-50
No. of Students	:	2	3	4	1

8. Construct Laspeyre's and Passche's Price Index from the following data. 4

Commodities	Base year 2010		Current Year 2012	
	Prize (₹)	Qty.(Kg.)	Prize (₹)	Qty.(Kg.)
A	4	2	6	3
B	3	5	2	1
C	8	2	4	6

9. What do you mean by consumer price index ? How does CPI construct ? What are its uses ? 6

10. Calculate mean median and mode from the following data. 6

Marks	46-50	41-45	36-40	31-35	26-30	21-25	16-20	11-15
No. of Students	3	11	22	35	26	13	10	7

11. Explain the following methods to collect the primary data. 6
    i) Personal Direct Interview
    ii) Mail Questionnaire

Part-B

12. What was the infant mortality rate of Indian at the time of independence ? 1
13. State any two institutional sources of rural credit. 1
14. What do you mean by miracle seeds ? 1
15. Discuss the occupational structure of Indian economy at the time of independence. 3
16. Explain 'modernisation' of common goals of economic planning in India. 3
17. Explain the external sector reforms of 1991. 3
18. What do you mean by devaluation ? How did it help to correct adverse BOP of the country ? 3
19. Distinguish between concept of absolute and relative poverty. 3
20. How does human capital formation help in economic development of the country ? 4
20. How does human capital formation help in economic development of the country ? 4
21. Why did economic reforms required in 1991 ? Explain my 4 reasons behind it ? 6
22. Explain objectives of industrial policy resolution act 1956. 6
23. Explain the meaning of inflation. What problems does it create ? Explain 6

Marking Scheme
Common Annual School Examination 2016-17
Subject - Economics
Class-XI

1. (i) Resources are limited

   (ii) Resources have alternating uses.

2. An index number is a statistical device for measuring changes in the magnitude of a group of related variables.

3. Requisites of a good sample are following:

   Representative, Adequacy, Homogeneity, Independence of selected sampling units etc.

4. characteristics of classification are :

   i) Homogeneity

   ii) Clarity

   iii) Flexibility

   explain any other also consider.

5. Spearman's Rank Coefficient of correlation gives less importance to the extreme values whereas Karl-Peasson's method gives importance to all values.

   r_R does not based on the numerical value of information it is based on qualitative information. Whereas Karl Peasrsen's method is based on the numerical value of information i.e. on quantitavely / numerically expressed data. Therefore result of r_R is not accurate as compared to Karl Pearson's method.

   r_R is more useful when no. of items are small data are given as ranks, scores etc. and data are not numerically expressed than Karl Pearson's method.

   It is a graphical method of measuring dispersion. The position of the curve compared with line of equal distribution then we estimate the dispersion.

   Applications or curves of Lorenz Curve.

   i) distribution of income and wealth.

   ii) distribution of wages.

   iii) distribution of production.

Consider any other also.

Or

Judge-I R_1	Judge-I R_2	$D=R_1-R_2$	D^2
1	3	–2	4
6	5	1	1
5	4	1	1
10	8	2	4
7	6	1	1
3	10	7	49
2	2	0	0
4	1	3	9
9	7	2	2
8	9	–1	1

$\Sigma D^2=72$

$$r_R=1-\frac{6\Sigma D^2}{\mu^3-N}=1-\frac{6x72}{10^3-10}$$

$$r_R=1-\frac{432}{1000-10}$$

$$=\frac{990-432}{1000-10}=\frac{558}{990}=0.56$$

7.

Marks	f	cf
10 – 20	2	2
20 – 30	3	5
30 – 40	4	9
40 – 50	1	10
	$\Sigma f=10$	

$$Q1 = \text{size of } \left(\frac{N}{4}\right)^{th} \text{ items} = \frac{10}{4} = 2.5\text{th item}$$

$$Q1 = 4+\frac{\frac{N}{4}-cf}{f} \times i$$

$= 20 + \frac{2.5 - 2}{3} \times 10$

$= 20 + \frac{0.5 \times 10}{3} = 20 + \frac{5}{3} = 20 + 0.67 = 20.67$

Q3 = Size of $\frac{3N^{th}}{4}$ item = $\frac{3 \times 10^{th}}{4} = 3 \times 2.5 = 7.5^{th}$ item

$Q3 = 4 + \frac{\frac{3N}{4} - cf}{f} \times i$

$= 30 + \frac{7.5 - 5}{4} \times 10$

$= 30 + \frac{2.5}{4} \times 10 = 30 + \frac{25}{4} = 30 + 6.25 = 36.25$

$QD = \frac{Q_3 - Q_1}{2} = \frac{36.25 - 20.67}{2} = \frac{15.58}{2} = 7.79$

QD= 7.79

Commodities	Base Year 2010		Current Year 2012		p_0q_0	p_1q_1	p_0q_1	p_1q_0
	p_0	q_0	p_1	q_1				
A	4	2	6	3	8	18	12	12
B	3	5	2	1	15	2	3	10
C	8	2	4	6	16	24	48	8
					39	44	63	30

Laspeyre's method $P_{01} = \frac{\Sigma p_1 q_0}{\Sigma p_0 q_0} \times 100 = \frac{30}{39} \times 100 = 76.92\%$

Pasche's method $P_{01} = \frac{\Sigma p_1 q_0}{\Sigma p_0 q_0} \times 100 = \frac{44}{63} \times 100 = 69.84\%$

9. Consumer price index is a statistical measure of changes in prices of goods and services over a period of time.

There are the following steps involved in construction of C=PI !

i) Determination of the class of people

ii) Conducting family budget enquiry

iii) Collection of price quotations.

Uses of CPI :

i) used for determining dearness allowances (DA) to Central Govt. employees.

ii) Indicator of movement of retail / prices of most of essential commodities of daily use.

iii) Useful for measuring real wages.

iv) helpful in demand forecasting

10.

Marks	Marks	MV(X)	f	$d' = \frac{X-A}{C}$	fd	cf
11-15	10.5–15.5	13	7	–3	–21	7
16-20	15.5–20.5	18	10	–2	–20	17
21-25	20.5–25.5	23	13	–1	–13	30
26-30	25.5–30.5	28	26	0	0	56
31-35	30.5–35.5	33	35	1	35	91
36-40	35.5–40.5	38	22	2	44	113
41-45	40.5–45.5	43	11	3	33	124
46-50	45.5–50.5	48	3	4	12	127
			Σf=127			$\Sigma fd'$=70

$$\overline{X} = \frac{A + \Sigma fd'}{\Sigma f} \times e$$

$$= 28 + \frac{70}{127} \times 5$$

$$= 28 + \frac{350}{127} = 28 + 2.75 = 30.75$$

$$M = \text{size of } \frac{N^{th}}{2} \text{ items} = \frac{127}{2} = 63.5^{th} \text{ items}$$

$$M = 4 + \frac{\frac{N}{2} - cf}{f} \times i$$

$$= 30.5 + \frac{63.5 - 56}{35} \times 5$$

$$= 30.5 + \frac{7.5}{7} = 30.5 + 1.07 = 31.57$$

mode(z) = 3M – 2$\overline{X}$

= 3 x 31.57 – 2 x 30.75
= 9 4 . 7 1 – 6 1 . 5 0
= 33.21

11. Explain (i) Personal direct interview
(ii) Mail Questionnaire

Part-B

12. about 218 per thousand.
13. (i) commercial bank
(ii) state co-operative banks (any other also consider)
14. High fielding variety seeds are also termed as miracle seeds.
15. Occupational structure means distribution of work force across different industries and sector.

Work force distribution (in%)

Agriculture Sector	70-75%
Industry Sector	10%
Service Sector	15-20%

16. Modernisation used in broader sence. It means adaptation of new technology in the area of production of goods and series as well as technologies social outlook such as the recognition that women should have the some rights as men and so on. Development of the country becomes very easy when we capable to adopt new technology and also give women equal opportunity in different fields along with men.
17. (i) Quantitative restriction on imports and exports have already been reduced considerably and the process is still on.
(ii) Custom duties i.e. taxes on imports and exports, have been reduced considerably.
(iii) The system of fixed exchange rate (determined by RBI) has been given up and market determined exchange rate system adopted. In other words F Ex. rate made control free.

18. When govt. of a country of officially lowers the external value of its domestic currency with respect of all other domestic currency with respect of all other foreign currencies, it is called devaluation. It promotes export and reduce import and in this way to bring equilibrium in BOP. Explain in detail.

19. Explain the concept of absolute poverty and concept of relation poverty.

20. Explain any four points :
    (i) raises production
    (ii) improves quality of life
    (iii) develop innovative skills
    (iv) helpful to adopt new technology and any other also consider.

21. i) Adverse position of BOP.
    ii) High rate of inflation
    iii) Gulf Crisis
    iv) High Fiscal deficit
    Consider any other also with explanation.

22. i) To accelerate the growth of industrialisation
    ii) To develop heavy industries
    iii) To expand public sector
    iv) To reduce disparities in income and wealth.
    v) To prevent concentration of monopoly power and wealth and income in the few hands.

23. In flatten is a state in which prices of all goods and services are rising i.e. value of money is falling continuously over a long period of time.
    Problems caused by it:
    i) it leads to reduction in the purchasing power of fixed income earness.
    ii) It raises the cost of production of goods and services any other also consider with explanation.

Module Test - Paper
Economics

Class-XI **Part-A** **Marks : 80+10 (OTBA)**

1. Define standard deviation. 1

2. State any two published sources of secondary data. 1

3. Distinguish between census and sampling methods. 3

4. What do you mean by cluster sampling ? State the area in which it is appropriate to use. 3

or

Define frequency array, frequency distribution and frequency.

5. Present the following data by histogram. 3

Daily Wages (Rs):	10-15	15-20	20-25	25-30	30-40	40-60	60-80
No. of Workers (f):	7	9	28	15	12	12	8

6. Calculate median from the following data. 3

Daily Wages (Rs):	10	20	30	40	50	60
No. of Workers (f):	4	5	8	6	3	1

7. Define tabulation. Briefly explain any four parts of table. 4

8. Calculate SD from the following data: 4

Age (yrs):	0-5	5-10	10-15	15-20	20-25	25-30
No. of Person:	2	6	9	12	8	5

or

Calculate Index No. of current year 2005 on the basis year 2000 by simple average of price relative method.

Commodities:	A	B	C	D	E
Price in 2005 (Rs):	100	80	160	220	40

9. Draw less than and more than agive and find out median from it. Verify the answer from the following data. 6

Weight (Kg.):	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of person :	5	7	10	15	12	8	2

Or

Draw the pie-diagram for each family from the following data.

Items of expenditure	Family A	Family B
i) Food	40	64
ii) Clothing	24	48
iii) Rent	16	32
iv) Education	4	10
v) Miscellaneous	16	6
Total	100	160

10. Briefly explain any 6 principles of drafting questionnaire. 6

11. Calculate Karl Pearon's Coefficient of correlation from following data: 6

X	15	18	21	24	27	30	36	39	42	48
Y	25	25	27	27	31	33	35	41	41	45

Part-B

12. What do you mean by Commercialisation of agriculture ? 1

13. Define Organic farming. 1

14. What is full form of NABARD ? 1

15. State any 3 features of Indian economy at the time of independence ? 3

16. Explain the common objective of planning 'Equity'. 3

17. Explain various types of industrial sector reform under liberalization. 3

18. How does migration promote human capital formation ? 3

19. Explain the importance of self help groups (SHbs) in rural area. 3

20. Distinguish between commercial and non-commercial sources of energy ? 4

21. Explain the role of infrastructure in economic development of India. 6

22. What do you mean by agricultural diversification ? Why is it required ? Explain. 6

23. Critically examine the impact of economic reforms measures taken by govt. in 1991. 6