DIRECTORATE OF EDUCATION
GOVT. OF NCT OF DELHI

Support Material
(2015-2016)

CLASS : XI

ECONOMICS

Under the Guidance of:

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OSD (Exam)
Production Team

Anil Kumar Sharma
PREFACE

It gives me immense pleasure to present before you the subject-wise supporting material for the students of classes X, XI and XII, prepared by the teams of dedicated and industrious teachers from the Directorate of Education. The objective of this material is impart sufficient practice to the students and to enable them to think analytically and rationally.

I hope that the students will find this study material useful and it will help them achieve academic excellence. I also hope that teachers will guide and motivate the students to use this material in preparing for examinations.

I would like to appreciate the efforts of the teams of teachers and group leaders under the enlightened guidance of the Director (Education).

Wishing best of luck to all the students.

(PUNYA SALILA SRIVASTAVA)
PREFACE

The Directorate of Education prepares Support Material for different subjects indigenously. Every year, experienced and knowledgeable teachers revise and update the material for children.

Support material is a boon especially for those children who cannot purchase the costly but substandard ‘guides’ available in the market. Prepared in-house, the material is not only much better in quality, it is also provided to the students free of cost.

The material can serve as a very handy tool for revision. I call upon the teachers to give their students sufficient practice in it.

I must share with the students that this material has the potential to enhance your performance and output, remarkably. So, please make it a habit to go through the textbook first and then, practice from the Support Material.

I take this opportunity to thank all the learned teachers and HoSs who have contributed to the preparation/revision these works.

My best wishes!

(PADMINI SINGLA)
FOREWORD

I am delighted to present before you the latest issues of the support material for the students of classes X, XI and XII. During the last few years the content and quality of the support material has undergone subtle changes. Teams of subject experts have devoted their time, efforts and energy to prepare this material which facilitates the students while preparing for their exams. The material is updated according to the latest changes and improvements which have been carried out by the CBSE and NCERT.

I hope that our teachers will give sufficient practice to their students through this material which in turn will improve their creative and analytical skills.

I appreciate the hard work of all the teachers, group leaders and members of the Examinations Branch whose efforts have materialized in the form of these books.

I wish you all the best.

Dr. Sunita S. Kaushik
Addl. Director of Education
(School and Exam)
# List of Members who Reviewed supporting material for class XI Economics

## Team Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Raj Singh Dahiya</td>
<td>Vice Principal</td>
<td>RPVV Narela</td>
</tr>
<tr>
<td>Mr. Sandeep Kumar Munjal</td>
<td>Lecturer</td>
<td>RPVV Civil Lines</td>
</tr>
<tr>
<td>Mr. Shailendra Rai</td>
<td>Lecturer</td>
<td>RPVV Surajmal Vihar</td>
</tr>
<tr>
<td>Mr. Sanjeev Kumar Gaur</td>
<td>Lecturer</td>
<td>RPVV Hari Nagar</td>
</tr>
<tr>
<td>Mr. Sushil Jain (EM)</td>
<td>Lecturer</td>
<td>GBSSS Sobapur</td>
</tr>
<tr>
<td>Mr. Saira Begum</td>
<td>Lecturer</td>
<td>GBSSS, Ballimaran</td>
</tr>
</tbody>
</table>
Suggested Question Paper Design
Economics (Code No. 030)
Class XI (2015-16)
March 2016 Examination

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

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Typology of Questions</th>
<th>Very short Answer/ Mcq 1 Mark</th>
<th>Short Answer I 3 Marks</th>
<th>Short Answer II 4 Marks</th>
<th>Long Answer 6 Marks</th>
<th>OTBA 5 Marks</th>
<th>Marks</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remembering - (Knowledge based Simple recall questions, to know meaning of specific facts, terms, concepts, principles, or theories; Identify information)</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>22</td>
<td>25%</td>
</tr>
<tr>
<td>2</td>
<td>Understanding - (Comprehension to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>23</td>
<td>25%</td>
</tr>
<tr>
<td>3</td>
<td>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)</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>18</td>
<td>20%</td>
</tr>
<tr>
<td>4</td>
<td>High Order Thinking Skills - (Analysis &amp; Synthesis- Classify, compare, contrast, or differentiate between different pieces of information, Organize and/or integrate unique pieces of information from a variety of sources)</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>19</td>
<td>21%</td>
</tr>
<tr>
<td>5</td>
<td>Evaluation - (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)</td>
<td>0</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>8</td>
<td>9%</td>
</tr>
<tr>
<td>Total</td>
<td>5x1 = 5</td>
<td>9x3 = 27</td>
<td>3x4 = 12</td>
<td>6x6 = 36</td>
<td>2x5 = 10</td>
<td>Theory 90+10 project = 100 marks</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

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 will be asked only during the annual examination to be held in, the March 2016. The open text material on the identified unit will be supplied to students in advance. The OTBA is designed to 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)

Rationale:

Economics is one of the social science, 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 to a systematic way.

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

The economics courses also contain main projects and activities. These will provide opportunities for the learners to explore various economic issue both from their day-to-day life and also from issues, which are broader and invisible in nature. The academic skills that they learn in these courses would 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 to some basic economic concepts and development of economic reasoning which the learners 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 the nation is facing today.
- Equipment with basic tools of economics and statistics to analyse economic issue. 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 -2015-16

**Paper I**

<table>
<thead>
<tr>
<th>Units</th>
<th>Periods</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part A</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statistics for Economics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Introduction</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>2. Collection, Organisation and Presentation of Data</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>3. Statistical Tools and Interpretation</td>
<td>66</td>
<td>27</td>
</tr>
<tr>
<td><strong>Part B</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian Economics Development</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>5. Current Challenges facing Indian Economy</td>
<td>60</td>
<td>15</td>
</tr>
<tr>
<td>6. Development Experience of India : A Comparison with Neighbours (OTBA)</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Theory Paper (10 + 5 = 90 Marks)</td>
<td>108</td>
<td>50</td>
</tr>
<tr>
<td><strong>Part C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Work</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The question paper will include a Section on open test 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 will be asked only during the annual examination to be held in the March, 2016. The open text material on the identified unit will be supplied to students in advance. The OTBA is designed to 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 collections, organisation and presentation of quantitative and qualitative information pertaining to various simple economic aspects systematically. It also intends to provide some basic statistical tools to analyse, and interpret any economic information and draw appropriate inference. In this process, the learners are also expected to understand the behaviour of various economic data.

Unit 1: Introduction  07 Periods

What is Economics?

Meanin, scope and importance of statistics in Economics.

Unit 2: Collection, Organisation and Presentation of data  27 Periods

Collections of data-sources of data-primary and secondary’s how basic data is collected; methods of collecting data; some important sources of secondary data: Census of India and National Sample Survey Organisation.

Organisation of Data: Meaning and types of variables; Frequency Distribution.

Presentation of Data: Tabular Presentation and Diagrammatic Presentation of Data (i) Geometric 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  66 Periods

(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

Measure of Dispersion - absolute dispersion (range, quartile deviation, mean deviation and standard deviation); relative dispersion (co-efficient
of quartile-deviation, co-efficient of mean deviation of variation); Lotenz Curve: meaning and its application.

Correlation - meaning scatter diagrams; Measures of correlation - Karl Pearson’s method (two variables ungrouped data) Spearman’s rank correlation

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

Some Mathematical tools used in Economics: Equation of a line, slope of a line, slope of a curve.

**Part B: Indian Economic Development**

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

18 Periods

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

Common goals of Five Years Plans.

Main features, problems and policies of agriculture (institutional aspects and new agricultural strategy, etc) Industry (industrial licensing, etc.) and foreign trade.

**Economic Reforms since 1991:**

Need and main features: liberalisation, globalisation and privatisation:

An appraisal of LPG policies.

**Unit 5: Current challenges facing Indian Economy:**

60 Periods

Poverty-absolute and relative, Main programmes for poverty alleviation: A critical assessment;

Rural development: Key issues - credit and marketing - role of cooperatives agricultural diversifications; alternative farming-organic farming.
Human Capital Formation: How people become resource; Role of human capital in economic development; Growth of Education Sector in India.


Infrastructure: Meaning and Types Case studies: Energy and Health: problems and policies. A critical assessment;

Sustainable Economic Development Meaning Effects of Economics 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 developmental indicators.

Part C Developing Projects in Economics. 12 Periods

The students may be encouraged to develop projects, as per the suggested project guidelines. Case studies of a few organisation/outlets may also be encouraged. Under this the students will do two comprehensive projects 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 institution: milk cooperatives, marketing cooperatives, etc.
(v) Case studies on public private partnership, outsourcing and outward Foreign Direct Investment.

(vi) Global warming.

(vii) Designing eco-friendly projects applicable in school such as paper and water recycle.

The idea behind introducing this unit is to enable the students to develop the ways and 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 project and using various statistical tools and their interpretation and conclusion.
Index

Part A: Statistics for Economics

1. Introduction

2. Collection, Organisation and Presentation of Data

3. Statistical Tools and Interpretation

Part B: Indian Economic Development


5. Current Challenges facing Indian Economy

6. Development Experience of India – A Comparison with Neighbour (OTBA)

Model Question Paper.
UNIT I
INTRODUCTION

Points to Remember:

- Economics is a science that studies human behavior as a relationship between ends and scarce means which have alternative uses.
- Scarcity means shortage of goods and resources in relation to their demand. Scarcity is the root of all Economic problems.
- Resources are:
  (a) Scarce / limited and
  (b) Have alternatives uses

<table>
<thead>
<tr>
<th>Activities</th>
<th>Economics Activities</th>
<th>Non-Economics Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Production</td>
<td></td>
<td>1. Social</td>
</tr>
<tr>
<td>2. Consumption</td>
<td></td>
<td>2. Religious</td>
</tr>
<tr>
<td>3. Investment</td>
<td></td>
<td>3. Political</td>
</tr>
<tr>
<td>4. Exchange</td>
<td></td>
<td>4. Charitable</td>
</tr>
<tr>
<td>5. Distribution</td>
<td></td>
<td>5. Parental</td>
</tr>
</tbody>
</table>

- Economics activities are those activities which are associated to earn money and wealth for life. These activities generate new income and increase the flow of goods and services. For example production, consumption, investment, distribution.
- Non economic activities are those activities which are not related to earn money and wealth. These activities neither generate income nor increase the flow of goods & services.
• Consumer: Consumer is an economic agent who buys the goods and services to satisfy his wants.

• Producer: One who produces goods and services for the generation of income.

• Service holder: A person who is in job and gives his services as a factor of production to earn wage or salary. E.g. Govt. Teacher.

• Service Provider: A person who provides services to final consumer to earn money e.g. transporter, auto driver.

• Statistics: Statistics is a method of taking decisions on the basis of numerical data.

• Statistics can be defined in two ways

  **Statistics**

<table>
<thead>
<tr>
<th>Singular sense</th>
<th>Plural Sense</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistic Means</td>
<td>Statistics means</td>
</tr>
<tr>
<td>Statistical methods</td>
<td>Numerical facts</td>
</tr>
<tr>
<td>Such as collection, organisation, classification</td>
<td>Which have been systematically</td>
</tr>
<tr>
<td>Presentation, analysis and</td>
<td>collected.</td>
</tr>
<tr>
<td>Interpretation of data</td>
<td></td>
</tr>
</tbody>
</table>

**Statistical data**

(1) Qualitative data - Not measured in numeric terms like beauty and intelligence.

(2) Quantitative data - Measured in numeric terms like price and Income.
Scope of Statistics

In the olden days the use of statistics was restricted to deal with the affairs of the state. But now-a-days the scope of statistics has spread to all those areas where numerical facts are used such as economics, business industry, medicine, physics, chemistry and numerous other field of knowledge.

Importance of Statistics in Economics

1. It enables an economist to present economic facts in precise and definite form.
2. Helps in condensing mass data into a few numerical measures.
3. Statistics is used in finding relationship between different economic factors.
4. Economics forecasting through statistical studies.
5. Helpful to formulate appropriate economic policies that solve economic problems.
6. Help to analyse the performance of policies applied before.

Function of Statistics

2. Statistics expresses facts in numbers.
3. Statics presents data in condensed form.
4. Statistics compares different phenomena and reassures relationship between them.
5. Statistics is helpful in formation of policies.
6. Statistics is helpful in economic forecastings.
Limitations of Statistics

1. Statistics does not study individuals.
2. Statistics results might lead to fallacious conclusions.
3. Statistics deals with quantitative facts only.
4. Statistics laws are true only on averages.
5. Only experts can make the best possible use of statistics.
6. Uniformity and homogeneity of data is essential.
7. Misuse of statistics is indeed its greatest limitation because misuse of statistics is possible.
UNIT - I

One Mark Questions :
1. Define economics.
2. State the meaning of scarcity.
3. Write the meaning of statistics in plural sense.
4. Give meaning of statistics in singular sense.
5. State one limitation of statistics.
6. What do you mean by economic activity ?
7. What are non-economic activities.
8. Write one function of statistics.
10. Who is a producer ?
11. Why does Economic problem arise ?

3/4 Marks Questions :
1. Briefly explain the term service holder and service provider with an example each.
2. What is the scope of statistics now a days ?
3. Explain the importance of statistics in economics.
4. Distinguish between quantitative and qualitative data with example.
5. Production, consumption and distribution are economic activities. Explain.
7. Which one of the following economic activity ? Give reasons.
   (i) Transporting sand from river bank to a town.
(ii) Attending marriage party.

(iii) Parental love and affection towards their children.

8. Which one of the following is non-economic activity? Give reasons.
(i) Production of printing machine for printing newspaper.
(ii) Service provided by the doctors in a hospital.
(iii) Establishment of free medical facility centre.

9. Explain any three limitations of statistics?

UNIT - I

Answers of One mark questions:

1. Economics is the study of how people and society choose the scarce resources that could have alternative uses to satisfy their unlimited wants.

2. Scarcity means shortage of goods and resources in relation to their demand.

3. In plural sense statistics means numerical facts which have been systematically collected.

4. In singular sense statistics means statistical methods such as collection, classification, presentation, analysis and interpretation of data.

5. Statistics deals with quantitative facts only.

6. An economic activity means that activity which is based on use of scarce resources for satisfaction of human wants.

7. The activities which have no economic aspect or are not related to earn money.

8. Statistics presents data is condensed form.

9. Consumer is an economic agent who buys the goods and services to satisfy his wants.
10. producer is one who produces or sell goods and services for the generation of income.

11. Economic problem arise due to scarcity of resources and alternative uses of resources.
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) Statistics 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 of 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 economic 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 economic 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 economic policies and plans that solve economic 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.

Sources of Data

<table>
<thead>
<tr>
<th>Primary Source</th>
<th>Secondary Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Published sources</td>
</tr>
<tr>
<td></td>
<td>2. Unpublished sources</td>
</tr>
</tbody>
</table>

Primary Data—Data originally collected in the process of investigation are known as primary data.

Methods of collecting primary data

There are three basic ways of collecting data:

(i) Personal interviews
(ii) Mailing (questionnaire surveys)
(iii) Telephone interviews
(iv) Indirect oral investigation
(v) Information from local sources
(vi) Enumerator method

- Secondary data which have been collected for some other purpose by some other agency are called secondary data.
- Secondary Data
Point of difference between Primary and Secondary data :- 1. Accuracy, 2. Originality, 3. Cost, 4. Need of modification

**Sources of secondary data**

**Published sources**
1. Govt. publication
2. semi-Govt. Publishing
3. Reports of committees & commissions
4. International publications

**Unpublished Sources**
Which are not published and are available in office ales and records may be used if necessary

**Other source**
web-site

**Important points to be kept in mind while drafting the questionnaire**

A. Introduction and purpose of investigation
B. Reasonable number questions.
C. Questions should be small & clear.
D. Questions should be arranged logically.
E. Instructions should be clear.
F. Proper space for answer.
G. Questions should be relevant to the investigation.
H. Personal questions should be avoided.
I. Avoid questions of calculations.
J. Cross Verification.

**Pilot Survey**: Before sending the questionnaire to the information. It should be pretested. As a result of its short comings if any, can be removed. Such pretesting named as pilot survey.

### Methods of sampling

<table>
<thead>
<tr>
<th>Random sampling</th>
<th>Non-Random Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Simple or unrestricted random sampling</td>
<td>(a) Judgement sampling</td>
</tr>
<tr>
<td>(b) Restricted random sampling</td>
<td>(b) Quota sampling</td>
</tr>
<tr>
<td>(i) Stratified</td>
<td>(c) convenience sampling</td>
</tr>
<tr>
<td>(ii) systematic</td>
<td></td>
</tr>
<tr>
<td>(iii) multistage or cluster sampling</td>
<td></td>
</tr>
</tbody>
</table>

- **Census survey**: In this method every element of population is included in the investigation.
- **Sample survey**: In this method a group of units representing all the units of the population is investigated.
- Population or universe
- In Statistics population or universe simply refers to an aggregate of items to be studied for an investigation.
- **Sample**: A group of items taken from the population for investigation and representative of all the items.
- 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 Error**: Can occur in any type of survey wheather it be a census or sample survey.
Sampling errors   Non sampling errors

1. Biased errors   1. Error in data acquisition
2. unbiased errors 2. Non. Response error
3. Measurement error

**Census of India and National Sample Survey Organization**

- The census of India provides 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 literacy, maternity, child care utilisation of public distribution system etc.
- The data-collected by NSSO survey are released through reports and its quarterly journal ‘Sarvekshana”.
- Eg. Size, growth rate, distribution of population, density, population, projections, sex composition and literacy.
UNIT-2

One mark questions:
1. What do you mean by primary data?
2. Give the meaning of secondary data.
3. Write the meaning of population in statistics.
4. Define sample.
5. What is sampling error?
6. What are non-sampling errors?
7. Write the name of statistical method which is less expensive and time saving.
8. Suppose there are 10 students in a class. Only three students to be selected out of them. How many samples are possible.
9. Expand NSSO.
10. Why does non sampling errors occur?

3/4 marks questions:
1. Differentiate between primary and secondary data.
2. Write four merits of census method of collecting the data.
3. Mention three demerits of sample method of collecting the data.
4. Distinguish between sampling and non-sampling errors.
5. What is meant by census method?
6. What do you mean by random sampling?
7. Discuss the term universe’ and ‘sample’ with example.
8. Census of India is the main source of secondary data. Explain.
10. What are the essentials of a sample?
6 marks questions :

1. What do you understand by ‘questionnaire’? Write the essential characteristics of a good questionnaire.

2. Distinguish between census and sample of collecting primary data.

3. What is NSSO? Write its functions.

4. What are the advantages and disadvantages of collecting primary data by personal interview and mailed questionnaire.

5. Do samples provide better results than surveys? Give reasons for your answer?

6. What precautions should be taken while using secondary data?

UNIT-2

Answer of one mark questions :

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

2. The data which are obtained by the investigator / enumerators from some one else records and were collected some other purpose.

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

4. Sample is a group of items taken from the population for investigation and representative of all the items or universe.

5. Sampling error is the difference between the result of studying a sample and the result of the census of the whole population.

6. Non sampling errors can occur is any type of survey wheather it be a census or sample survey such as measurement errors as measurement erros, non-response errors.
7. Sampling survey.

8. To select the sample of 3 students out of 10 students we can use random sampling either by using random number table or lottery method. No. of possible samples is 120.


10. Non-sampling errors can occur in any type of survey. Whether it be a census or sample survey such as measurement errors. Non response errors.

**Hints**

¾ Marks questions:

10. Essentials of a sample are representative, independent, adequacy and homogeneity.

6 marks questions:

7. The ability of collecting organizations, objective and scope, method of collection, time and condition of collection, definition of unit and accuracy.

1 Marks questions:

\[
\text{Total Population} \times \left(\frac{\text{No. of sample}}{(\text{Total Population no. of sample})}\right)
\]

\[
\frac{10!}{3! (10-3)} = \frac{10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{3 \times 2 \times 1 \times (7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1)} = 120
\]
Frequently Asked Questions

COLLECTION OF DATA

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

Primary Data
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.
UNIT-2
ORGANIZATION 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 facilitated 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.

<table>
<thead>
<tr>
<th>Characteristics of classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homogeneity</td>
</tr>
<tr>
<td>Suitability</td>
</tr>
</tbody>
</table>

• A variable is a characteristic which is capable of being measured and capable of change in its value from time to time.

Basis of classification

Raw data can be classified as:

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 location such as countries, states, cities, districts, etc.

3. Qualitative classification data are classified with reference to descriptive characteristics like sex, caste, religion, literacy etc.
4. Quantitative classification: Data are classified on the basis of some measurable characteristics such as height, age, weight, income, marks of students.

- A mass of data in its original form is called raw data. It is an unorganized mass of various items.
- A characteristic which is capable of being measured and changes its value over time is called a variable. It is of two types.
- (a) Discrete  (b) Continuous
  - Discrete: Discrete variable are those variables that increase in jumps or in complete numbers and are not fractional.
  - Continuous variable: Continuous variables are those variables that
- A frequency distribution is a comprehensive way to classify raw data of a quantitative variable. It shows how different values of a variable are distributed in different classes along with their corresponding class frequencies.
- The class mid-point or class mark is the middle value of a class. It lies halfway between the lower class limit and the upper class limit of a class and can be ascertained in the following manner.

\[
\text{Class mid-point} = \frac{\text{upper class limit} + \text{lower class limit}}{2}.
\]

- 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 0-1, 10-20.
- In comparison 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 limits are parts of the class intervals eg 0-9, 10-19.

- The classification of data as a frequency distribution has an inherent 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.
- Classification of data implies conversion of raw data into statistical series. Broadly statistical series are of two types.

### Types of series

<table>
<thead>
<tr>
<th>Individual series</th>
<th>Frequency series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete series</td>
<td>Frequency distribution</td>
</tr>
<tr>
<td>Or frequency array</td>
<td>or continuous series</td>
</tr>
</tbody>
</table>

- Individual series are those series in which the items are listed singly. For example:

<table>
<thead>
<tr>
<th>Sr. No. of Labourer</th>
<th>Daily wages (in Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>45</td>
</tr>
</tbody>
</table>
• A discrete series or frequency array is that series in which data are prescribed in a way that exact measurements of items are clearly shown. The example in following table illustrates a frequency array

**Frequency array of the size of household**

<table>
<thead>
<tr>
<th>Size of the household</th>
<th>Number of household (Frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

• A 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. In other words data are classified into different classes with a range, the range is called class-intervals.

**Frequency distribution or continuous series**

<table>
<thead>
<tr>
<th>Marks</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-20</td>
<td>4</td>
</tr>
<tr>
<td>20-30</td>
<td>5</td>
</tr>
<tr>
<td>30-40</td>
<td>8</td>
</tr>
<tr>
<td>40-50</td>
<td>5</td>
</tr>
<tr>
<td>50-60</td>
<td>4</td>
</tr>
<tr>
<td>60-70</td>
<td>3</td>
</tr>
</tbody>
</table>
1 Marks Questions:

1. What is meant by organization of data
2. State the meaning of classification.
3. What is meant by homogeneity of data?
4. State the meaning of qualitative classification.
5. Define raw data.
6. Define discrete series or frequency array.
7. What is meant by exclusive series?
8. Write the name of the series which include all items up to its upper limit.
9. What is meant by frequency?

½ Marks questions:

1. State the objectives of classification.
2. Write the characteristics of a good classification.
3. Define the discrete and continuous variables with the help of example.
4. Write three advantages classification.
5. Make a frequency distribution from following data.

Use exclusive method and first class interval is 100-110.

<table>
<thead>
<tr>
<th>125</th>
<th>108</th>
<th>112</th>
<th>126</th>
<th>110</th>
<th>113</th>
<th>136</th>
<th>130</th>
<th>149</th>
<th>155</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>130</td>
<td>126</td>
<td>138</td>
<td>125</td>
<td>132</td>
<td>119</td>
<td>125</td>
<td>140</td>
<td>148</td>
</tr>
<tr>
<td>145</td>
<td>137</td>
<td>144</td>
<td>150</td>
<td>142</td>
<td>150</td>
<td>137</td>
<td>132</td>
<td>166</td>
<td>154</td>
</tr>
</tbody>
</table>

Make a frequency distribution inclusive method.

<table>
<thead>
<tr>
<th>10</th>
<th>17</th>
<th>15</th>
<th>22</th>
<th>16</th>
<th>11</th>
<th>19</th>
<th>24</th>
<th>29</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>26</td>
<td>32</td>
<td>14</td>
<td>20</td>
<td>17</td>
<td>23</td>
<td>27</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td>15</td>
<td>18</td>
<td>24</td>
<td>35</td>
<td>15</td>
<td>18</td>
<td>21</td>
<td>28</td>
<td>33</td>
<td>18</td>
</tr>
<tr>
<td>34</td>
<td>13</td>
<td>10</td>
<td>16</td>
<td>22</td>
<td>20</td>
<td>29</td>
<td>19</td>
<td>23</td>
<td>31</td>
</tr>
</tbody>
</table>
5/6 Marks questions:

1. What is loss of information in classified data.
2. Do you agree that classified data is better than raw data? Why?
3. Explain types of classification of data?

Answer of 1 mark questions.

1. Organization of data refers to the systematic arrangement of figures in such a form that comparison of masses of similar data may be facilitated and further analysis may be possible.
2. Classification is the grouping of related facts into different classes.
3. The similarity of features of all the units of a class is called homogeneity.
4. The classification according to qualities or attributes of the data called qualitative classification.
5. A mass of data in its crude form is called raw data. It is an unorganised mass of the various items.
6. A discrete series of frequency array is that series in which data are presented in a way that exact measurement of items are clearly shown.
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. Inclusive series.
9. Frequency is number of times an item repeats itself in the series.

Hint

¾ Marks questions:

4. (1) helps in comparison  (2) Make data attractive and effective
   (3) Provide simple and brief information.
6 Marks Questions:

1. (1) Does not show details.
   (2) After classification an individual’s observation has no significance in further statistical calculation.
   (3) Use of class mark instead of actual values of observation.

2. **Raw Data** | **Classified Data**
   1. Highly Disorganised | 1. Properly organized
   2. Very large and cumbersome to handle | 2. Provide brief information and easy to handle
   3. More time consuming | 3. Less time consuming
   4. Statistical methods can not be used easily | 4. Statistical methods can be used easily
Frequently Asked Question

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 classification 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 basic of either the presence or the absence of a qualitative characteristic. Such a classification of data on attributes is called 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 item of study can be classified in to class. If all 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 with the help of following data by arranging in ascending order.

<table>
<thead>
<tr>
<th>Marks</th>
<th>Tally-bars</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>
Presentation of Data

The presentation of data means exhibition of data in such a clear and attractive manner that these can be easily understood and analysed.

Forms of Presentation of data

| Textual/Descriptive Presentation | Tabular Presentation | Diagrammatic Presentation |

Tabulation—It is the process of presenting data in the form of a table.

Parts or components of Table.

| Table Number | Title | Caption | Stubs | Body of the Table | Unit of measurement | Source | Head Note | Foot Note |

Features of a good table.

(a) Compatible with the objective
(b) Helpful in comparison
(c) Ideal Size
(d) Stubs
(e) Headings
(f) Percentage and ratio
(g) Sources of Data
(h) Simplicity

Kinds of Table

| According to Purpose | According to originality | According to construction |

---
Types of Diagrammatic Presentation

- Geometric Form
  - Pie Diagram
  - Bar Diagram

- Frequency Diagram
  - Histogram
  - Frequency Polygon
  - Frequency curve
  - Ogive curve

- Sub divided bar diagram are those diagrams which present simultaneously, total values and parts there in a set of a data.
- Pie or circular diagram is a circle divided into various segment showing the percent value of a series.
- Histogram is graphical presentations of a frequency distribution of a continuous series.
- Frequency polygon is drawn by joining the mid points of the tops of rectangles in a histogram.
- Frequency curve is obtained by joining the points of a frequency polygon through free hand smooth curve not by straight lines.
- Cumulative frequency curves or ogive curve is the curve which is constructed by plotting cumulative frequency data on the graph paper in the form of a smooth curve.

1 Marks 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.

¾ 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

<table>
<thead>
<tr>
<th>Year</th>
<th>XI A</th>
<th>XI B</th>
<th>XI C</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>40</td>
<td>80</td>
<td>130</td>
</tr>
<tr>
<td>2008</td>
<td>80</td>
<td>100</td>
<td>120</td>
</tr>
<tr>
<td>2009</td>
<td>100</td>
<td>120</td>
<td>180</td>
</tr>
</tbody>
</table>

6. Present the following data of final consumption expenditure of family with the help of a pie-diagram.
<table>
<thead>
<tr>
<th>Items</th>
<th>Expenditure (in rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloths</td>
<td>1600</td>
</tr>
<tr>
<td>Food</td>
<td>2400</td>
</tr>
<tr>
<td>Education</td>
<td>1000</td>
</tr>
<tr>
<td>Electricity</td>
<td>1500</td>
</tr>
<tr>
<td>Others</td>
<td>2500</td>
</tr>
</tbody>
</table>

7. Make a histogram from following data:

<table>
<thead>
<tr>
<th>Marks</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-35</td>
<td>10</td>
</tr>
<tr>
<td>35-40</td>
<td>24</td>
</tr>
<tr>
<td>40-45</td>
<td>30</td>
</tr>
<tr>
<td>45-50</td>
<td>44</td>
</tr>
<tr>
<td>50-55</td>
<td>28</td>
</tr>
<tr>
<td>55-60</td>
<td>22</td>
</tr>
<tr>
<td>60-65</td>
<td>14</td>
</tr>
<tr>
<td>65-70</td>
<td>8</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Items</th>
<th>% expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages</td>
<td>15</td>
</tr>
<tr>
<td>Bricks</td>
<td>20</td>
</tr>
<tr>
<td>Wooden work</td>
<td>5</td>
</tr>
<tr>
<td>Paint</td>
<td>10</td>
</tr>
<tr>
<td>Steel</td>
<td>25</td>
</tr>
<tr>
<td>Cement</td>
<td>12</td>
</tr>
<tr>
<td>Supervision</td>
<td>07</td>
</tr>
<tr>
<td>Others</td>
<td>06</td>
</tr>
</tbody>
</table>
5/6 Marks Questions

1. Explain the main parts of a table?

2. Explain the precautions while constructing an ideal table?

3. Draw ogive curve class than and more than with the help of following data.

<table>
<thead>
<tr>
<th>Marks</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>20</td>
</tr>
<tr>
<td>10-20</td>
<td>14</td>
</tr>
<tr>
<td>20-30</td>
<td>24</td>
</tr>
<tr>
<td>30-40</td>
<td>26</td>
</tr>
<tr>
<td>40-50</td>
<td>28</td>
</tr>
<tr>
<td>50-60</td>
<td>38</td>
</tr>
<tr>
<td>60-70</td>
<td>40</td>
</tr>
<tr>
<td>70-80</td>
<td>10</td>
</tr>
</tbody>
</table>

4. Make Frequency polygon or frequency curve.

<table>
<thead>
<tr>
<th>Marks</th>
<th>No. students</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-35</td>
<td>10</td>
</tr>
<tr>
<td>35-40</td>
<td>12</td>
</tr>
<tr>
<td>40-45</td>
<td>20</td>
</tr>
<tr>
<td>40-45</td>
<td>26</td>
</tr>
<tr>
<td>45-50</td>
<td>20</td>
</tr>
<tr>
<td>50-55</td>
<td>38</td>
</tr>
<tr>
<td>55-60</td>
<td>28</td>
</tr>
<tr>
<td>60-65</td>
<td>18</td>
</tr>
<tr>
<td>65-70</td>
<td>12</td>
</tr>
</tbody>
</table>
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 segment 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.


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.
Frequently Asked question
PRESENTATION OF DATA

Q10. Define tabulation. (1 marks)

Ans. It is a process of presenting data in the form of a table.

Q11. Questions in constructions of histogram, frequency polygon and frequency group.

Ans. Hints

- **Histogram**—all rectangles must be attached with each other.

- **Frequency polygon**—Must join the mid-points of the tops of rectangles with scale.

  Frequency curve—Must join the mid-points of the tops of rectangles with free hand.

Q12. Explain the main part of a table

Ans. Hints—Explain any six following points.

(a) Table number

(b) Title

(c) Caption

(d) Stubs

(e) Body of table

(f) Source

(g) Note

(h) Unit of measurement.
UNIT-3
MEASURES OF CENTRAL TENDENCY

Points to Remember:

♦ A central tendency is a single figure that represents the whole mass of data

♦ Arithmetic mean or 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 than it is called simple arithmetic mean and when different items of a series are given different weights according with their relative importance is known weighted arithmetic mean.

♦ Median is the middle value of the series when arranged in ascending order.

♦ When a series is divided into more than two parts, the dividing values are called Partition values.

♦ If a statistical series is divided into four equal parts, the end value of each part is called a quartile and denoted by ‘Q’.

♦ The first quantile or lower quartile (Q1) is that value which divides the first half of an orderly arranged series into two equal parts.

♦ Third quartile or upper quartile (Q3) is that value which divides the letter half of an ascending orderly arranged series into two equal parts.

♦ Mode is the value which occurs most frequently in the series, that modal value has the highest frequency in the series.

♦ Main purposes and functions of averages.

(i) To represent a brief picture of data.
(ii) Comparison.

(iii) Formulation of policies.

(iv) Basis of statistical analysis.

(v) One value for all the group or series.

♦ Essentials of a good average.

(i) Easy to understand.

(ii) Easy to compute

(iii) Rigidly defined.

(iv) Based on all the items of series.

(v) Certain in character

(vi) Least effect of a change in the sample.

(vii) Capable of algebraic treatment.

♦ Merits of Arithmetic mean:

(i) Simplicity

(ii) Certainty

(iii) Based on all values.

(iv) Algebraic treatment possible.

(v) Basis of comparison

(vi) Accuracy test possible.

♦ Demerits of Arithmetic mean:

(i) Effect of extreme values.

(ii) Mean value may not figure in the series.

(iii) Unsuitability.
(iv) Misleading conclusions.
(v) Can not be used in case of qualitative phenomenon.

♦ Merits of Median :
(i) Simple measure of central tendency.
(ii) It is not affected by extreme observations.
(iii) Possible even when data is incomplete.
(iv) Median can be determined by graphic presentation of data.
(v) It has a definite value.

♦ Demerits of median :
(i) Not based on all the items in the series.
(ii) Not suitable for algebraic treatment.
(iii) Arranging the data in ascending order takes much time.
(iv) Affected by fluctuations of items.

♦ Merits of mode :
(i) Simple and popular measure of central tendency.
(ii) It can be located graphically with the help of histogram.
(iii) Less effect of marginal values.
(iv) No need of knowing all the items of series.
(v) It is the most representative value in the given series.

♦ Demerits of mode :
(i) It is an uncertain measure.
(ii) It is not capable of algebraic treatment.
(iii) Procedure of grouping is complex.
(iv) It is not based on all observations.
♦ Relation among mean, median and mode:

Mode = 3 median - 2 mean, Median = \( \frac{1}{3}(z + 2\bar{X}) \)

Location of median by graph:

(i) By ‘Less than’ or ‘More than’ ogives method a frequency distribution series is first converted into a less than or more than cummulative series as in the case of ogives, data are presented graphically to make a ‘less than’ or ‘more than’ ogive, \( N/2 \) item of the series is determined and from this point (on the y-axis of the graph) a perpendicular is drawn to the right to cut the cummulative frequency curve. The median value is the one where cummulative frequency curve cuts corresponding to x-axis.

(ii) Less than and more than ogive curve method present the data graphically in the form of ‘less than’ and ‘more than’ ogives simultaneously. The two ogives are superimposed upon each other to determine the median value. Mark the point where the ogive curve cut each other, draw a perpendicular from that point on x-axis, the corresponding value on the x-axis would be the median value.

♦ Graphic presentation of mode:

Prepare a histogram from the given data. Find out the rectagle whose height is the highest. This will be the modal class. Draw two lines-one joining the top right point of the rectangle preceding the modal class with top right point of the modal class. The other joining the top left point of the modal class with the top left point of the post modal class. From the point of intersection of these two diagonal lines, draw a perpendicular on horizontal axis i.e., x-axis the point where this perpendicular line meets x-axis, gives us the value of mode.
**Formulae of calculating arithmetic mean:**

<table>
<thead>
<tr>
<th>Types of series</th>
<th>Direct Method</th>
<th>Shortcut Method</th>
<th>Step deviation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Series</td>
<td>$\bar{X} = \frac{\Sigma X}{N}$</td>
<td>$\bar{X} = A + \frac{\Sigma d}{N}$</td>
<td>$\bar{X} = A + \frac{\Sigma d'}{N} \times C$</td>
</tr>
<tr>
<td>Discrete series</td>
<td>$\bar{X} = \frac{\Sigma fx}{N}$</td>
<td>$\bar{X} = A + \frac{\Sigma fd}{N}$</td>
<td>$\bar{X} = A + \frac{\Sigma fd'}{N} \times C$</td>
</tr>
<tr>
<td>Continuous Series</td>
<td>$\bar{X} = \frac{\Sigma fm}{N}$</td>
<td>$\bar{X} = A + \frac{\Sigma fd}{N}$</td>
<td>$\bar{X} = A + \frac{\Sigma fd'}{N} \times C$</td>
</tr>
</tbody>
</table>

- Combined Mean $\bar{X}_{12} = \frac{X_1N_1 + X_2N_2}{N_1 + N_2}$
- Weighted mean $\bar{X} = \frac{\sum WX}{\sum W}$

**Formulae of calculating median and partition values:**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Individual Series</th>
<th>Discrete Series</th>
<th>Continuous Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of item</td>
<td>Size of item</td>
<td>Size of item</td>
<td>Size of item</td>
</tr>
<tr>
<td>Median</td>
<td>$\left(\frac{N+1}{2}\right)$th item</td>
<td>$\left(\frac{N+1}{2}\right)$th item</td>
<td>$\frac{N}{2}$</td>
</tr>
<tr>
<td>First Quartile $Q_1$</td>
<td>$\left(\frac{N+1}{4}\right)$th item</td>
<td>$\left(\frac{N+1}{4}\right)$th item</td>
<td>$\frac{N}{4}$</td>
</tr>
<tr>
<td>Third Quartile $Q_3$</td>
<td>$\frac{3(N+1)}{4}$th item</td>
<td>$\frac{3(N+1)}{4}$th item</td>
<td>$\frac{3(N)}{4}$</td>
</tr>
</tbody>
</table>
Formula of calculating mode in continuous series:

\[
\text{Mode} = L_1 + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times C
\]

Where,
- \( L_1 \) = Lower limit of modal class
- \( f_0 \) = Frequency of the group preceding the modal class
- \( f_1 \) = Frequency of the modal class
- \( f_2 \) = Frequency of the group succeeding the modal class
- \( C \) = Magnitude or class interval of the modal class.

One Mark Questions:

1. What is meant by central tendency?
2. What are the types of mean?
3. Name any two partition values.
4. Give the meaning of arithmetic average.
5. Define mode.
6. Pocket money of 8 students is Rs. 6, 12, 18, 24, 30, 36, 42 and 48, calculate mean.
7. Write the formula for weighted mean.
8. What is the relation among the mean, median and mode?
9. Which partition value divide the total set of values into four equal parts.
10. Give the meaning of combined mean.
11. A shoes manufacturing company only manufactures shoes for adults. Company wants to know the most popular size. Which type of central tendency will be the most appropriate?
12. Which diagram is used for finding the value of mode graphically?
13. Mention one demerit of mode.
14. If the values of mean and median are 40 and 48. Find out the most probable value of mode.
15. Calculate mode from the following data 10, 8, 10, 6, 4, 12, 10, 8, 10, 18, 16, 10, 18, 10, 10.
16. How is the value of median computed with the help of ogive curves?
17. What is positional average?
18. What is the sum of deviations taken from mean in a series.
19. If the value of Mode and Median are 64 and 48. Find out the value of Mean.
20. If the value of mean and Mode are 40 and 64. Find out the value of Median.

¾ Marks Questions:

1. Give four objective of statistical average.
2. Show that the sum of deviations of the values of the variable from their arithmetic mean is equal to zero.
3. Write the merits of median.
4. Calculate median from the following data

<table>
<thead>
<tr>
<th>X</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>f</td>
<td>3</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

(Ans.30)
5. State three advantages of mode.
6. What are four demerits of mean.
7. Average income of 50 families is Rs. 30000.

Average income of 12 families is Rs. 18000.

Find the average income of rest of families (Ans. 3378.95)
8. What are the essentials of a good average.
9. Mean marks obtained by a student in his five subjects are 15. In english he secures 8 marks, in economics 12, in mathematics 18 and in commerce 9. Find out the marks he secured in statistics.

10. What is meant by weighted arithmatic mean ? How is it calculated ?

11. Name and define three statistical averages.

12. State any two reasons of difference between median and mode.

13. Explain the characteristics, merits and demerits of mean.

6 Marks Questions :

1. Explain the step deviation method of calculating arithmatic mean, taking an imaginary set of data.

2. Describe the objectives and functions of measures of central tendency.

3. Why is the Arithmatic mean the most commonly used measure of central tendency ?

4. What do you mean by mode ? Discuss the methods of calculating it.

5. Explain the characteristics, merits and demerits of median.

6. Rahul made the following runs in different matches.

<table>
<thead>
<tr>
<th>Runs</th>
<th>5-15</th>
<th>15-25</th>
<th>25-35</th>
<th>35-45</th>
<th>45-55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>10</td>
<td>12</td>
<td>17</td>
<td>19</td>
<td>22</td>
</tr>
</tbody>
</table>

Calculate the arithmatic mean of the runs by step deviation method.

(Ans. 33.87)

7. Find the missing frequency if the mean of following data is 44.8.

<table>
<thead>
<tr>
<th>X</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>5</td>
<td>?</td>
<td>15</td>
<td>10</td>
<td>8</td>
<td>5</td>
</tr>
</tbody>
</table>

(Ans. 7)
8. Find the median of the following data.

<table>
<thead>
<tr>
<th>Marks</th>
<th>46-50</th>
<th>41-45</th>
<th>36-40</th>
<th>31-35</th>
<th>26-30</th>
<th>21-25</th>
<th>16-20</th>
<th>11-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of students</td>
<td>3</td>
<td>11</td>
<td>22</td>
<td>35</td>
<td>26</td>
<td>13</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>

3 (Ans. 31.7)

9. From the following table find mode with the help of graphical presentation and check your result with mathematical formula.

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Families</td>
<td>14</td>
<td>23</td>
<td>27</td>
<td>21</td>
<td>25</td>
</tr>
</tbody>
</table>

(Ans. 24)

10. From the following data find out the value of median graphically.

<table>
<thead>
<tr>
<th>Marks</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of student</td>
<td>6</td>
<td>11</td>
<td>20</td>
<td>12</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

(Ans. 26.5)

11. If the arithmetic mean of the data given below is 28, find (a) the missing frequency and (b) the median of the series:

<table>
<thead>
<tr>
<th>Profit per retail shop (in Rs.)</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of retail shop</td>
<td>12</td>
<td>18</td>
<td>27</td>
<td>-</td>
<td>17</td>
<td>6</td>
</tr>
</tbody>
</table>

(Ans. The value of missing frequency is 20 and value of the median is Rs. 27.41)

**Answer of one mark questions:**

1. A single figure that represents the whole series is known as central tendency.
2. There are two types of mean-simple and weighted.
3. (i) Quartile  (ii) Decile (iii) Percentile
4. When the sum of all items is divided by their number is known as arithmetic average.

5. The value which occurs most frequently in series is known as mode.

6. \[
   \bar{X} = \frac{X_1 + X_2 + X_3 + \ldots + X_N}{N}
   \]
   \[
   = \frac{6 + 12 + 18 + 24 + 30 + 36 + 42 + 48}{8} = \frac{216}{8} = 27
   \]

7. \[
   \bar{X_w} = \frac{\sum wX}{\sum w}
   \]

8. Mode = 3 median - 2 mean

9. Quartile

10. When the mean of two or more than two series is computed collectively, it is known as combined mean.

11. Mode

12. Histogram

13. One demerit of mode is that it is not capable of algebraic treatment.

14. Mode = 3 median - 2 mean
   \[
   = (3 \times 48) - (2 \times 40) = 144 - 80
   \]  
   \[
   = 64
   \]

15. Mode = 10

16. The point of intersection where less than ogive curve and more than ogive curve intersect each other gives us the value of median.

17. Those averages whose value is worked out on the basis of their position in the statistical series.

19. \[
\bar{X} = \frac{1}{2} (3M - Z)
\]
\[
= \frac{1}{2} (3 \times 48 - 64) = \frac{1}{2} (144 - 64)
\]
\[
= \frac{1}{2} (80) = 40
\]

20. \[
M = \bar{X} - \frac{1}{3} (\bar{X} - Z)
\]
\[
= 40 - \frac{1}{3} (40 - 64)
\]
\[
= 40 - \frac{1}{3} (-24)
\]
\[
= 48
\]

**Frequently Asked Question**

**MEASURES OF CENTRAL TENDENCY**

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

**Ans.**

(a) Arithmetic Mean

(b) Arithmetic Mean

(c) Median.

2. Write merit and demerit of mean or median.

**Ans.**

<table>
<thead>
<tr>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merits</td>
<td>Merits</td>
</tr>
<tr>
<td>(a) No. need of arrangement of data</td>
<td>(a) Definite value</td>
</tr>
<tr>
<td>(b) Easy to calculate</td>
<td>(b) Expressed/determined graphically.</td>
</tr>
<tr>
<td>(c) Based on all values of series</td>
<td>(c) Easy of calculate</td>
</tr>
</tbody>
</table>
Demerits

(a) Can’t be located graphically
(b) Calculation not possible if single item missing
(c) Not used in case of qualitative measurement

Demerits

(a) Arrangement of data is required
(b) Not suitable for algebraic treatment
(c) Affected by fluctuations of items.

3. Requisites of an ideal averages Ans.
   (i) Easy to understand.
   (ii) Easy to compute.
   (iii) Rigidly defined
   (iv) Based on all items of series.
   (v) Capable of algebraic treatment
   (vi) Least effect of fluctuation.
UNIT-3
MEASURES OF DISPERSION

Points of remember
♦ Dispersion is a measure of the variation of the items from central value.
♦ The measures of dispersion are important to compare uniformity, consistency and reliability amongst variables / series.
♦ Absolute measures of dispersion are expressed in terms of original unit of series.
♦ Relative measures are expressed in ratios or percentage, also known as coefficients of dispersion.

Measures of Dispersion

(i) Range
(ii) Inter quartile range
(iii) Quartile deviation or Semi-Inter-quartile range
(iv) Mean deviation
(v) Standard Deviation
(vi) Lorenz curve

Range : Range is defined as the difference between two extreme observations i.e. the largest and the smallest value.

Symbolically
R = L - S
Where R = Range
L = Largest Value
S = Smallest value

Coefficient of range = \( \frac{L - S}{L + S} \)
**Inter Quartile Range**

- Inter quartile range is the difference between upper quartile and lower quartile.

  Inter-quartile range = $Q_3 - Q_1$

  Where
  
  $Q_3$ = Third quartile or upper quartile.
  
  $Q_1$ = First quartile or lower quartile

- Quartile Deviation

  Quartile deviation is known as half of difference of third quartile ($Q_3$) and first quartile ($Q_1$). It is also known as semi inter quartile range.

  $$Q.D. = \frac{Q_3 - Q_1}{2}$$

  Where
  
  $Q.D.$ = Quartile deviation
  
  $Q_3$ = Third quartile or upper quartile.
  
  $Q_1$ = First quartile of lower quartile.

  Coefficient of quartile deviation

  $$\text{Coefficient of Q.D.} = \frac{Q_3 - Q_1}{Q_3 + Q_1}$$

**Mean Deviation**

Mean deviation / average deviation is the arithmetic mean of the deviations of various items from their average (mean, median or mode) generally from the median.

**Calculation of mean deviation**

<table>
<thead>
<tr>
<th></th>
<th>Individual Series</th>
<th>Discrete Series</th>
<th>Continuous Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.D.</td>
<td>[ \frac{\sum</td>
<td>D</td>
<td>}{N} ]</td>
</tr>
</tbody>
</table>
Where,

\[ \text{MD} = \text{Mean deviation} \]
\[ |D| = \text{Deviations from mean or median ignoring \pm Signs} \]
\[ N = \text{Number of item (Individual Series)} \]
\[ N = \text{Total number of Frequencies (Discrete and continuous series)} \]
\[ F = \text{Number of frequencies.} \]

Coefficient of mean deviation

\[
\frac{\text{M.D.}}{X} \quad \text{(From Mean)} \quad \text{or} \quad \frac{\text{M.D.}}{M} \quad \text{(From Median)} \quad \text{or} \quad \frac{\text{M.D.}}{Z} \quad \text{(From Mode)}
\]

**Merit of Mean donation**

1. Simplicity
2. Based on all observation
3. Less effect of extreme values
4. Rigidly defined
5. Best measure for comparison

**Demerits of Mean Desniation**

1. Not capable of algebraic treatments
2. Not well defined
3. Not suitable for open-ended series
4. Less reliable
5. Difficult adulations

**Standard Deviation**

Standard deviation is the best and widely used measure of dispersion. Standard deviation is the square root of the arithmetic mean of the squares of deviation of its items from their arithmetic mean. Calculation of standard deviation in individual series.

Actual mean method,

\[
\sigma = \sqrt{\frac{\sum x^2}{N}}
\]

Where \( \sigma = \text{Standard Deviation} \)

\( \sum x^2 = \text{Sum total of square of Deviation taken from Mean} \)

\( N = \text{Number of items} \)
Shortcut method or assumed mean method:

\[
\sigma = \sqrt{\frac{\Sigma fd^2}{N} - \left[ \frac{\Sigma fd}{N} \right]^2}
\]

Where \(d^2\) = Square of deviation taken from assumed mean.

Calculation of standard deviation in discrete series:

Actual mean method or direct method

\[
\sigma = \sqrt{\frac{\Sigma fx^2}{N}}
\]

Where \(\sigma\) = S.D.

\(\Sigma x^2\) = Sum total of the squared deviations multiplied by frequency

\(N\) = Number of pair of observation.

Short cut method or assumed mean method

\[
\sigma = \sqrt{\frac{\Sigma fd^2}{N} - \left[ \frac{\Sigma fd}{N} \right]^2 \times c}
\]

\(\sigma\) = S.D.

\(\Sigma fd^2\) = Sum total of the squared deviations Multiplied by frequency

\(\Sigma fd\) = Sum total of deviations multiplied by frequency.

\(N\) = Number of pair of observations.

Step deviation method

\[
\sigma = \sqrt{\frac{\Sigma fd^2}{N} - \left[ \frac{\Sigma fd}{N} \right]^2 \times c}
\]

\(\sigma\) = Standard Deviation

\(\Sigma fd^2\) = Sum total of the squared step deviations multiplied by frequency.
\[ \Sigma fd = \text{Sum total of step deviations multiplied by frequency} \]
\[ C = \text{Common factor} \]
\[ N = \text{Number of pair of observation} \]

**Calculation of standard deviation in continuous series**

Actual mean method:

\[ \sigma = \sqrt{\frac{\Sigma fx^2}{N}} \]

\( \sigma = \text{S.D.} \)
\[ \Sigma fx^2 = \text{Sum total of the squared deviation multiplied by frequency.} \]
\[ N = \text{Number of pair of observations or assumed mean method} \]

Step deviation method:

\[ \sigma = \sqrt{\frac{\Sigma fd^2}{N} - \left(\frac{\Sigma fd}{N}\right)^2} \times c \]

**Merits of standard donation**

1. Based on all values
2. Rigidly defined
3. Less effect of fluctuations
4. Capable of algebraic treatment

**Demerits of standard donation**

1. Difficult to compute
2. More stress on extreme items
3. Dependent on unit of measurement.

**Coefficient of variation**

When two or more groups of similar data are to be compared with respect to stability (or uniformly or consistency or homogeneity). Coefficient of variation is the most appropriate measures.

\[ CV = \frac{\sigma}{X} \times 100 \]
Where \[ \text{C.V.} = \text{Coefficient of variation} \]
\[ \sigma = \text{Standard deviation} \]
\[ \bar{X} = \text{Arithmetic mean} \]

LORENZ CURVE

- The Lorenz curve devised by Dr. Max O. Lorenz is a graphic method of studying dispersion.
- The Lorenz curve always lies below the line of equal distribution, unless the distribution is uniform.
- The area between the line of equal distribution and the plotted curve gives the extent of inequality in the items. The larger the area, more is the inequality.

Application Lorenz Curve

(i) Distribution of home
(ii) Distribution of wealth
(iii) Distribution of wages
(iv) Distribution of production
(v) Distribution of population

Construction of Lorenz Curve

1. Series is converted into a cumulative frequency series. The cumulative sum of items is assumed to be 100 and different items are converted into percentage of the cumulative sum.
2. Cumulative sum of frequency is assumed to be 100 and different frequencies are converted into percentage of sum of frequency.
3. Cumulative frequencies are plotted on x-axis and cumulative items are plotted on y-axis of graph.
4. On both axis values are plotted from 0-100.
5. A diagonal line joining 0, 0 with cumulative frequency 100, 100 is drawn. It is called line of equal distribution.

6. Actual data are plotted by joining different points. This is 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 the 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?
11. What is a line of equal distribution.
12. Write two demerits of range.
13. Which is most widely used and best measurement of dispersion.
14. Give the formula of calculating quartile deviation.
15. Write two uses of range.

Short Answer Type Questions (¼ 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?
   Describe the various methods of computing 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:

<table>
<thead>
<tr>
<th>Marks</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Students</td>
<td>8</td>
<td>12</td>
<td>7</td>
<td>30</td>
<td>10</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

(Range = 60 marks : Coefficient of range = 0.75)

7. Find out the value of quartile deviation and its coefficient from the following data.

<table>
<thead>
<tr>
<th>Roll No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marks</td>
<td>20</td>
<td>28</td>
<td>40</td>
<td>12</td>
<td>30</td>
<td>15</td>
<td>50</td>
</tr>
</tbody>
</table>

(Quartile deviation = 12.5 marks) (Coefficient of quartile deviation = 0.45)

8. Calculate mean deviation from median and its coefficient from the following data.
   100, 150, 80, 90, 160, 200, 140.

   (Mean deviation from median = 34.28)

   (Coefficient of mean deviation = 0.74)

9. Calculate semi-interquartile range and its coefficient of the following data.

<table>
<thead>
<tr>
<th>Marks</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
<th>60-70</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of std.</td>
<td>4</td>
<td>8</td>
<td>11</td>
<td>15</td>
<td>12</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

(Q.D. = 11.55 Coefficient of Q.D. = 0.337)
10. Calculate the standard deviation for the following data.

5, 8, 7, 11, 14

(S.D. = 3.16)

11. Coefficient of variation of two series are 58% and 69% and their standard deviation are 21.2 and 15.6 what are their means?

(Means X = 36.35 and 22.60)

12. From the following data of two workers, identify who is more consistent worker?

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>40</td>
<td>42</td>
</tr>
<tr>
<td>SD</td>
<td>8</td>
<td>6</td>
</tr>
</tbody>
</table>

(Worker B is more consistent as his C.V.)

(14.39%) is less than that of worker A (20%)

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

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?

5. Find the range and coefficient of range of the following:

<table>
<thead>
<tr>
<th>Age in years</th>
<th>5-10</th>
<th>10-15</th>
<th>15-20</th>
<th>20-25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>5</td>
</tr>
</tbody>
</table>

(Range = 20 Coefficient of range = 0.67)
6. Find out quartile deviation, Interquartile range and coefficient of quartile deviation of the following series.

<table>
<thead>
<tr>
<th>Height in inches</th>
<th>58</th>
<th>59</th>
<th>60</th>
<th>61</th>
<th>62</th>
<th>63</th>
<th>64</th>
<th>65</th>
<th>66</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Plants</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>15</td>
<td>10</td>
<td>15</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

(Q.D. = 1, Inter quartile range = 2 Coeff of QD = 0.016)

7. Calculate mean deviation from deviation from median.

<table>
<thead>
<tr>
<th>No. of fruits per plant</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Plants</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>11</td>
<td>18</td>
<td>24</td>
<td>12</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

(Me = 5, M.D. = 1.68)

8. Find mean deviation from median of the marks secured by 100 students in a class test as given below:

<table>
<thead>
<tr>
<th>Marks</th>
<th>60-63</th>
<th>63-66</th>
<th>66-69</th>
<th>69-72</th>
<th>72-75</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of std.</td>
<td>5</td>
<td>18</td>
<td>42</td>
<td>27</td>
<td>8</td>
</tr>
</tbody>
</table>

(M.D. = 2.26)

9. Calculate Coefficient of quartile deviation from the following data:

<table>
<thead>
<tr>
<th>X (less than)</th>
<th>200</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>8</td>
<td>20</td>
<td>40</td>
<td>45</td>
<td>50</td>
</tr>
</tbody>
</table>

(Coefficient of quartile deviation 0.24)

10. Calculate standard deviation of the given data:

<table>
<thead>
<tr>
<th>Size</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>3</td>
<td>7</td>
<td>22</td>
<td>60</td>
<td>85</td>
<td>32</td>
<td>8</td>
</tr>
</tbody>
</table>

(S.D. = 1.149)
11. Calculate standard deviation from the following series:

<table>
<thead>
<tr>
<th>Class</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
<th>60-70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

(S.D. = 15.81)

12. The given table shows the daily income of workers of two factories. Draw the Lorenz Curves for both the factories.

<table>
<thead>
<tr>
<th>Daily income (Rs.)</th>
<th>0-100</th>
<th>100-200</th>
<th>200-300</th>
<th>300-400</th>
<th>400-500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory A</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Factory B</td>
<td>15</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

13. The prices of share of company X and company Y are given below. State which company is more stable?

<table>
<thead>
<tr>
<th>Company X</th>
<th>25</th>
<th>50</th>
<th>45</th>
<th>30</th>
<th>70</th>
<th>42</th>
<th>36</th>
<th>48</th>
<th>34</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Y</td>
<td>10</td>
<td>70</td>
<td>50</td>
<td>20</td>
<td>95</td>
<td>55</td>
<td>42</td>
<td>60</td>
<td>48</td>
<td>80</td>
</tr>
</tbody>
</table>

(C.V. of prices of share of X Co. = 29.72%) (C.V. of prices of share of Y Co = 45.9%)

Prices of share of X Co. is stable.

14. Calculate coefficient of variation from the data given below:

<table>
<thead>
<tr>
<th>X</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>10</td>
<td>25</td>
<td>15</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>

(X = 12.9, S.D. = 1.997, C.V. = 15.5%)

15. Compare range, quartile deviation mean deviation and standard deviation on the basis of calculations.
16. What is meant by mean deviation? Give steps for calculating mean deviation in case of individual series.

17. Calculate the standard deviation from following data by step deviation method.

<table>
<thead>
<tr>
<th>X</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

($\sigma = 9.165$)

Answers of Very Short Type questions (01 Marks)

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

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

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 = $\frac{\Sigma f |D|}{X}$

8. Inter quartile range.

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

10. Relative measures are expressed in ratios or percentage, also known as coefficient of dispersion.
11. While drawing Lorenz curve zero of X-axis and 100 on y-axis and 100 on y-axis are jointed by a line. This line is known as line of equal distributions.

12. Demerits of range:
   (i) it is not based on all the observation of series.
   (ii) It very much affected by extreme items.

13. The most widely used and best measurement of dispersion is standard deviation.

14. Quartile deviation $$= \frac{Q_3 - Q_1}{2}$$

15. Two uses of range:
   (i) Quality control
   (ii) Measure of fluctuations.

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

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

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

\[ \text{Data:}\]
<table>
<thead>
<tr>
<th>Wages (in Rs.)</th>
<th>Factory A</th>
<th>Factory B</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>60</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>100</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>140</td>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>180</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>220</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>260</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>300</td>
<td>8</td>
<td>5</td>
</tr>
</tbody>
</table>

Hints: Calculate $X$ and standard deviations of both factory.

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

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

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

Points to remember:

- Meaning of correlation:
- Correlation is a statistical tool which studies the relationship between two variables e.g. change in price leads to change in quantity demanded.
- Correlation studies and measures the direction and intensity of relationship among variables. It measures co-variation not causation.

- Type of Correlation

Correlation is classified into positive and negative correlation. The correlation is said to be positive when the variables move together in the same direction. e.g. sale of Ice cream and temperature move in same direction.

The correlation is said to be negative when the variables move in opposite direction. e.g. When you spend more time in studying chances of your failure decline.

- Examples of positive correlation are:
  1. Price and supply of a commodity.
  2. Increase in Height and Weight.
  3. Age of husband and age of wife.
  4. The family income and expenditure on luxury items.

- Examples of negative correlation are:
  1. Sale of woolen garments and day temperature.
2. Price and Demand of a commodity.
3. Yield of crops and price.

- **Degree of Correlation**:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfect</td>
<td>+1</td>
<td>–1</td>
</tr>
<tr>
<td>High</td>
<td>Between + 0.75 and + 1</td>
<td>Between –0.75 and – 1</td>
</tr>
<tr>
<td>Moderate</td>
<td>Between + 0.25 and + 0.75</td>
<td>Between – 0.25 &amp; – 0.75</td>
</tr>
<tr>
<td>Low</td>
<td>Between 0 and + 0.25</td>
<td>Between 0 and – 0.25</td>
</tr>
<tr>
<td>Zero</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Methods of estimating correlation:
  
  (a) Scatter diagram**
  
  (b) Karl pearson’s coefficient of correlation.
  
  (c) Spearman’s rank correlation.

- Scatter diagram offers a graphic expression of the direction and degree of correlation.

- Karl pearson’s coefficient of correlation is a quantitative method of calculating correlation. It gives a precise numerical value of the degree of linear relationship between two variables.

- Karl person’s coefficient of correlation is also known as product moment correlation.

  Formula : \( r = \frac{\Sigma xy}{N \sigma x \sigma y} \)

  Here,

  \( r = \) Coefficient of correlation

\[\text{Class XI : Economics}\]  74
\[ x = (X - \overline{X}) \]

\[ y = (Y - \overline{Y}) \]

\[ \sigma_x = \text{Standard deviation of } X - \text{series} \]

\[ \sigma_y = \text{Standard deviation of } Y - \text{series.} \]

\[ N = \text{Number of observations} \]

Karl Pearson’s coefficient of correlation is calculated by following methods:

(a) Actual mean method: \[ r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \cdot \Sigma y^2}} \]

Here,

\[ r = \text{Coeff. Of correlation} \]

\[ x = (X - \overline{X}) \]

\[ y = (Y - \overline{Y}) \]
(b) Assumed mean method:

\[ r = \frac{\Sigma dx \cdot dy \left( \frac{\Sigma dx}{N} \right) \left( \frac{\Sigma dy}{N} \right)}{\sqrt{\Sigma dx^2 - \left( \frac{\Sigma dx}{N} \right)^2} \sqrt{\Sigma dy^2 - \left( \frac{\Sigma dy}{N} \right)^2}} \]

\[ r = \frac{N \Sigma dx \cdot dy - (\Sigma dx) (\Sigma dy)}{\sqrt{N \Sigma dx^2 - (\Sigma dx)^2} \sqrt{N \Sigma dy^2 - (\Sigma dy)^2}} \]

Here,
\[ dx = \text{Deviations of x-series from assumed mean} = (X - A) \]
\[ dy = \text{Deviation of Y-series from assumed mean} = (Y - A) \]
\[ \Sigma dx dy = \text{Sum of multiple of } dx \text{ and } dy \]
\[ \Sigma dx^2 = \text{Sum of the square of } dx \]
\[ \Sigma dy^2 = \text{Sum of the square of } dy \]
\[ \Sigma dx = \text{Sum of the deviation of x-series} \]
\[ \Sigma dy = \text{Sum of the deviation of Y-series} \]
\[ N = \text{Number of pairs of observations} \]

When value of the variables are large, we use step deviation method to reduce the burden of calculation.

(c) Step deviation method

\[ r = \frac{N \Sigma dx ' dy ' - (\Sigma dx ') (\Sigma dy ')}{\sqrt{N \Sigma dx '^2 - (\Sigma dx ')^2} \sqrt{N \Sigma dy '^2 - (\Sigma dy ')^2}} \]

Here, \( dx ' = \frac{dx}{C_1} \)
\[ dy = \frac{dy}{C_2} \]
C1 is common factor for series – x  
C2 is common factor for series – y  

Properties of correlation coefficient (r)

(i) Correlation coefficient (r) has no unit
(ii) A negative value of r indicates an inverse relation.
(iii) If r is positive then two variables move in the same direction.
(iv) The value of r lies between minus – 1 and + 1
(v) If r is zero, the two variables are uncorrelated.
    \[ -1 \leq r \leq 1 \]
(vi) If \( r = +1 \) or \( r = -1 \), the correlation is perfect.
(vii) A high value of r indicates strong linear relationship and a low value or r indicates a weak linear relationship.
(viii) The value of r is unaffected by the change of origin and change of scale.

Given two variables \( x \) and \( y \) let us define two new variables

\[
U = \frac{X - A}{B} \quad V = \frac{Y - C}{D}
\]

Here \( A \) and \( C \) are assumed means of \( X \) and \( V \) respectively. \( B \) and \( D \) are common factors. They \( r_{xy} = r_{uv} \).

Spearman’s rank correlation method is used to calculate coefficient of correlation of qualitative variables such as beauty, bravery, wisdom, ability virtue etc. It is development by British Psychologist C.E. spearman.

Formula \( r = 1 - \frac{6\Sigma D^2}{N^3 - N} \)
Here, \( r_s = \) Coefficient of rank correlation.

\( D = \) Rank differences

\( N = \) Numbers of rank

When ranks are repeated the formula is:

\[
rs = 1 - \frac{6 \left[ \sum d^2 + \frac{(m_1 - m_1)}{12} + \frac{(m_2 - m_2)}{12} + \ldots \right]}{N^3 - N}
\]

Where \( m_1, m_2 \ldots \) are number of repetitions of ranks.

**Very Short Answer Type Questions**:

**(One Mark 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.
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 of 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-efficient 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. Interpret the values of \( r \) as 1, -1 and 0.

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

<table>
<thead>
<tr>
<th>( x )</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

(Ans \( r = 0 \))

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

<table>
<thead>
<tr>
<th>( x )</th>
<th>1</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>2</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>14</td>
<td>16</td>
</tr>
</tbody>
</table>

(Ans. \( r = +1 \))

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

<table>
<thead>
<tr>
<th>( x )</th>
<th>11</th>
<th>10</th>
<th>15</th>
<th>13</th>
<th>10</th>
<th>16</th>
<th>13</th>
<th>8</th>
<th>17</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>9</td>
<td>7</td>
<td>11</td>
<td>9</td>
<td>6</td>
<td>12</td>
<td>11</td>
</tr>
</tbody>
</table>

6. Calculate Karl Peason’s coefficient of correlation on the following data:

<table>
<thead>
<tr>
<th>( x )</th>
<th>15</th>
<th>18</th>
<th>21</th>
<th>24</th>
<th>27</th>
<th>30</th>
<th>36</th>
<th>39</th>
<th>42</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>25</td>
<td>25</td>
<td>27</td>
<td>27</td>
<td>31</td>
<td>33</td>
<td>35</td>
<td>41</td>
<td>41</td>
<td>45</td>
</tr>
</tbody>
</table>

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

\[
\begin{align*}
\text{X series} & \quad \text{Y series} \\
(i) \quad \text{No. of items} & \quad 15 \quad 15 \\
(ii) \quad \text{Arithmetic mean} & \quad 25 \quad 18 \\
(iii) \quad \text{Square of deviations} & \quad \text{From arithmetic mean} \quad 136 \quad 138
\end{align*}
\]
(iv) Summation of products of deviations of X and Y series from their 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

<table>
<thead>
<tr>
<th>X</th>
<th>10</th>
<th>12</th>
<th>8</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>15</td>
<td>10</td>
<td>6</td>
<td>25</td>
<td>16</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

(Ans. r = + 0.14)

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

<table>
<thead>
<tr>
<th>X</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>10</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>8</td>
<td>2</td>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>X</th>
<th>68</th>
<th>75</th>
<th>90</th>
<th>75</th>
<th>50</th>
<th>62</th>
<th>40</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>10</td>
<td>10</td>
<td>13</td>
<td>9</td>
<td>8</td>
</tr>
</tbody>
</table>

(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:

<table>
<thead>
<tr>
<th>Judge I</th>
<th>1</th>
<th>6</th>
<th>5</th>
<th>1</th>
<th>0</th>
<th>3</th>
<th>2</th>
<th>4</th>
<th>9</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Judge II</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Judge III</td>
<td>6</td>
<td>4</td>
<td>9</td>
<td>8</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

Find out by Spearman’s rank difference method which pair of judges has a common taste in respect of beauty.
(Ans. $r_s$ I & II = $-0.21$; $r_s$ II & III = $-0.29$; $r_s$ I & III = $+0.64$)
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.

<table>
<thead>
<tr>
<th>Height (in inches)</th>
<th>72</th>
<th>60</th>
<th>63</th>
<th>66</th>
<th>70</th>
<th>75</th>
<th>58</th>
<th>78</th>
<th>72</th>
<th>62</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (in Kg.)</td>
<td>65</td>
<td>54</td>
<td>55</td>
<td>61</td>
<td>60</td>
<td>54</td>
<td>50</td>
<td>63</td>
<td>65</td>
<td>50</td>
</tr>
</tbody>
</table>
5. Calculate the correlation coefficient of ten marks obtained by 12 students in Mathematics and statistics and interpret it.

<table>
<thead>
<tr>
<th>Marks (in Maths)</th>
<th>50</th>
<th>54</th>
<th>56</th>
<th>59</th>
<th>60</th>
<th>62</th>
<th>61</th>
<th>65</th>
<th>67</th>
<th>71</th>
<th>71</th>
<th>74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marks (in statistics)</td>
<td>22</td>
<td>25</td>
<td>34</td>
<td>28</td>
<td>26</td>
<td>30</td>
<td>32</td>
<td>30</td>
<td>28</td>
<td>34</td>
<td>36</td>
<td>40</td>
</tr>
</tbody>
</table>

(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 variables move in opposite direction.

4. The correlation is said to be positive when the variables 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

**Frequently Asked Question**

**CORRELATION**

**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)**

<table>
<thead>
<tr>
<th>X</th>
<th>10</th>
<th>12</th>
<th>11</th>
<th>13</th>
<th>12</th>
<th>14</th>
<th>9</th>
<th>12</th>
<th>14</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>7</td>
<td>9</td>
<td>12</td>
<td>9</td>
<td>13</td>
<td>8</td>
<td>10</td>
<td>2</td>
<td>7</td>
<td>13</td>
</tr>
</tbody>
</table>

*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 :

\[
\begin{align*}
    r &= \frac{\Sigma xy}{\Sigma x^2 \times \Sigma y^2} \\
    &= \text{Answer} = -0.115 \text{ (Low degree of negative correlation)}
\end{align*}
\]
Q.4. Find out rank difference correlated of X and Y.

<table>
<thead>
<tr>
<th>X</th>
<th>80</th>
<th>78</th>
<th>75</th>
<th>75</th>
<th>58</th>
<th>67</th>
<th>60</th>
<th>59</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>16</td>
<td>15</td>
<td>77</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>X</th>
<th>R1</th>
<th>Y</th>
<th>R2</th>
<th>D=R1-R2</th>
<th>D²</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>1</td>
<td>12</td>
<td>8</td>
<td>-7</td>
<td>49</td>
</tr>
<tr>
<td>78</td>
<td>2</td>
<td>13</td>
<td>7</td>
<td>-5</td>
<td>25</td>
</tr>
<tr>
<td>75</td>
<td>3.5</td>
<td>14</td>
<td>5</td>
<td>-1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>75</td>
<td>3.5</td>
<td>14</td>
<td>5</td>
<td>-1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>58</td>
<td>8</td>
<td>14</td>
<td>5</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>67</td>
<td>5</td>
<td>16</td>
<td>2</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>60</td>
<td>6</td>
<td>15</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>59</td>
<td>7</td>
<td>17</td>
<td>1</td>
<td>6</td>
<td>36</td>
</tr>
</tbody>
</table>

ED² = 142

\[
\text{rk} = 1 - \frac{6\left[\sum D² + \frac{1}{12}(m_1^3 - m_1) + \frac{1}{12}(m_2^3 - m_2)\right]}{N^3 - N}
\]

\[
\text{rk} = 1 - \frac{6\left[142 + \frac{2^3 - 2}{12} + \frac{3^3 - 3}{12}\right]}{8^3 - 8}
\]

\[
= 1 - \frac{6\left[142 + \frac{6}{12} + \frac{24}{12}\right]}{504}
\]

\[
= 1 - \frac{6[144.5]}{504}
\]

\[
= 1 - \frac{867}{504}
\]

\[
= -.72
\]
UNIT-3
INTRODUCTION TO INDEX NUMBER

Introduction to index number :

- An index number is a statistical device for measuring changes in the magnitude of a group of related variables.
- Features of Index Numbers
- Index numbers are expressed in terms of percentages. However percentage sign (%) is never used.
- Index numbers are relative measurement of group of data.
- Index numbers offer a precise measurement of the quantitative change in the concerned variables over time.
- Index numbers shows changes terms of averages.
- Types of Index numbers :
  (i) Wholesale price index (WPI)
  (ii) Consumer price index (CPI) or Cost of living index
  (iii) Index of industrial production (IIP)
  (iv) Index of Agricultural production (IAP)
  (v) Sensex

Methods of constructing index numbers

<table>
<thead>
<tr>
<th>Construction of</th>
<th>Construction of weighted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Index numbers</td>
<td>Index numbers</td>
</tr>
<tr>
<td>Simple</td>
<td>Simple</td>
</tr>
<tr>
<td>Aggregative</td>
<td>Average</td>
</tr>
<tr>
<td>Method of Price</td>
<td>Relatives</td>
</tr>
<tr>
<td>Relatives</td>
<td>Method</td>
</tr>
</tbody>
</table>
– Simple aggregative method.

\[ P_{01} = \frac{\Sigma P_1}{\Sigma P_0} \times 100 \]

Here, \( P_{01} = \) Price index of the current year
\( \Sigma P_1 = \) Sum of the prices of the commodities in the current year
\( \Sigma P_0 = \) Sum of the prices of the commodities in the base year

– Current year: Current year is the year for which average change is to be measured or index of index number is to be calculated.

– Base year: Base year is the year of reference from which we want measure extent of change in the current year. The index number of base year is generally assumed to be 100.

– Simple average of price Relatives method:

\[ P_{01} = \frac{\Sigma \left( \frac{P_1}{P_0} \times 100 \right)}{N} \]

Here,
\( P_{01} = \) Price index of the current year
\( \frac{P_1}{P_0} \times 100 = \) Price relatives
\( N = \) Number of commodities

– Weighted average of price relative method:

\[ P_{01} = \frac{\Sigma RW}{\Sigma W} \]

Here,
\( P_{01} = \) Index number for the current year
\( W = \) Weight
\( R = \) Price relatives i.e. \( \frac{P_1}{P_0} \times 100 \)
Weighted Aggregative method

(i) Laspeyre’s method \( P_01 = \frac{\Sigma P_i q_0}{\Sigma P_0 q_0} \times 100 \)

(ii) Paasche’s method \( P_01 = \frac{\Sigma P_i q_1}{\Sigma P_0 q_1} \times 100 \)

(iii) Fisher’s Method \( P_01 = \sqrt{\frac{\Sigma P_i q_0}{\Sigma P_0 q_0} \times \frac{\Sigma P_i q_1}{\Sigma P_0 q_1}} \times 100 \)

Some Important index numbers

(i) Consumer price index (CPI) : CPI is also known as the cost of living index, measures the average change in retail prices.

Methods of constructing CPI

\[ CPI = \frac{\Sigma WR}{\Sigma W} \]

Here,

\[ R = \frac{P_1}{P_0} \times 100 \]

\[ W = \text{Weights} \]

(B) Aggregative expenditure method :

\[ CPI = \frac{\Sigma P_i q_0}{\Sigma P_0 q_0} \times 100 \]

(ii) Wholesale price index (WPI) : WPI

Indicates the change in the general price level.

(iii) Index of industrial production (IIP) :

IIP is used to measure the relative increase or decrease in the level of industrial production

\[ IIP_{01} = \frac{\sum \left( \frac{q_i}{q_0} \right) W}{\Sigma W} \]
Here, 
\[ q_1 = \text{Level of production in the current year} \]
\[ q_0 = \text{Level of production in the base year} \]
\[ W = \text{Weight} \]

(iv) Index of agriculture production (IAP)

IAP is used to study the rise and fall of the yield of principal crops from one period to other period.

(v) Sensex: Sensex is the short form of Bombay stock exchange sensitive index with 1978-79 as base. It is the benchmark index for the Indian stock market. It consists of 30 stocks which represent 13 sectors of the economy and the companies are the leaders in their respective industries.

Problems in construction of index numbers:

(i) Purpose of index number.

(ii) Selection of base year.

(iii) Selection items.

(iv) Selection of the prices of items.

(v) Selection of method of weighting

(vi) Selection of sources of data

(vii) Choice of an average.

(viii) Choice of method.

Uses of index numbers:

(i) To measure the purchasing power of money.

(ii) Knowledge of change in standard of living.

(iii) Adjustment in salaries and allowances.
(iv) Help in framing suitable policies.

(v) As economic barometers.

**Inflation and index numbers:**

- Inflation is described a situation characterised by a sustained increase in the general price level.

- Generally inflation is measured in terms of wholesale price index.

- Rate of inflation \( \frac{A_2 - A_1}{A_1} \times 100 \)

Here,

\( A_1 = \text{WPI for week first (1)} \)

\( A_2 = \text{WPI for week second (2)} \)

**Very Short Answer Type Questions:**

**One Mark questions:**

1. What do you mean by index numbers?

2. State two categories of price index numbers.

3. Define base year.

4. Name the consumer groups for which CPI is computed.

5. What is price relative?

6. Give Laspeyre’s formula for weighted index number.

7. Where can we get some important index numbers such as CPI, WPI lip etc.?

8. Write the formula for calculating index of industrial production.

9. How many types of CPI are constructed in India?

10. Define current year.
11. What is the difference between simple index number and weighted index numbers?

12. Give the formula to calculate the rate of inflation.

13. Which sign is used to indicate the price index number?

14. What does wholesale price index indicate?

15. Give Paasche’s formula for weighted index number.

16. Which index number is known as cost of living index?

17. Mention the weight of primary articles in wholesale price index.

18. In how many groups all the commodities are classified for WPI?

19. Mention the weightage of different groups in index of industrial production.

20. Which index number is generally used to measure inflation?

21. Which change is measured in consumer price index?

22. Which item having the highest weight in CPI for industrial worker?

23. In which index number there is a relative importance of the items?

**Short Answer Type Questions:**

¾ Marks Questions:

1. State three difficulties of constructing index numbers.

2. What are the desirable properties of the base period?

3. Why do we need an index number?

4. Write a short note on inflation and index numbers.

5. Why is it essential to have different CPI for different categories of consumer?

6. Mention the difficulties in construction of consumer price index.

7. What is the difference between a price index and a quantity index?

8. Define index number. State its utility.
9. What does an index of industrial production measure? Give formula to calculate IIP.

10. Calculate price index number for 2004 taking 1994 as the base year from the following data by simple aggregative method:

<table>
<thead>
<tr>
<th>Commodities</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price in 1994 (in Rs.)</td>
<td>100</td>
<td>40</td>
<td>10</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>Price in 2004 (in Rs.)</td>
<td>140</td>
<td>60</td>
<td>20</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

Anss. 130.

11. Construct as index number for year 2005 taking 2000 as the base year from the following data by simple average of price relative method.

<table>
<thead>
<tr>
<th>Commodities</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price in 2000 (in Rs.)</td>
<td>100</td>
<td>80</td>
<td>160</td>
<td>220</td>
<td>40</td>
</tr>
<tr>
<td>Price in 2004 (in Rs.)</td>
<td>140</td>
<td>120</td>
<td>180</td>
<td>240</td>
<td>100</td>
</tr>
</tbody>
</table>

Anss. 122.32.

12. Calculate weighted average of price relative index number of prices for 2010 on the basis of 2004 from the following data:

<table>
<thead>
<tr>
<th>Goods</th>
<th>Weight</th>
<th>Price 2004 (in Rs.)</th>
<th>Price 2010 (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>20</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>Rice</td>
<td>12</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Milk</td>
<td>8</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Ghee</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sugar</td>
<td></td>
<td></td>
<td>(Ans. 139.4)</td>
</tr>
</tbody>
</table>

13. Calculate price index number from the following data using Laspeyres method.
<table>
<thead>
<tr>
<th>Commodity</th>
<th>Base Year</th>
<th>Current Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price Rs.</td>
<td>Quantity</td>
</tr>
<tr>
<td>A</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>60</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>D</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>E</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

(Ans. 124.44)

14. From the data given below, construct Passche’s price index:

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Base Year</th>
<th>Current Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price Rs.</td>
<td>Quantity</td>
</tr>
<tr>
<td>A</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

(Ans. 69.84)

15. An enquiry into the budgets of the middle class families in a certain city gave the following information:

<table>
<thead>
<tr>
<th>Expenses on items</th>
<th>Food</th>
<th>Fuel</th>
<th>Clothing</th>
<th>Rent</th>
<th>Misc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (Rs.) (in 2004)</td>
<td>1500</td>
<td>250</td>
<td>750</td>
<td>300</td>
<td>400</td>
</tr>
<tr>
<td>Price (Rs.) (in 1995)</td>
<td>1400</td>
<td>200</td>
<td>500</td>
<td>200</td>
<td>250</td>
</tr>
</tbody>
</table>
What is the cost of living index during the year 2004 as compared with 1995? (Ans. 134.49)

16. From the data given below construct the consumer price index number:

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Price Relatives</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>250</td>
<td>45</td>
</tr>
<tr>
<td>Rent</td>
<td>150</td>
<td>15</td>
</tr>
<tr>
<td>Clothing</td>
<td>320</td>
<td>20</td>
</tr>
<tr>
<td>Fuel and lighting</td>
<td>190</td>
<td>5</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>300</td>
<td>15</td>
</tr>
</tbody>
</table>

(Ans. 253.5)

17. If the salary of a person in the base year is Rs. 4,000 per annum and the current year salary is Rs. 6,000, by how much should his salary be raised to maintain the same standard of living if the CPI is 400? (Ans. : 10000)

ANSWER TYPE QUESTIONS

6 MARKS QUESTIONS

index numbers. Discuss the utility

1. Explain the problems involved in the construction of

2. Discuss the various uses of index numbers.

3. Discuss the features of index numbers.

4. Give the meaning of whole sale price index numbers. of WPI.

5. Write short notes on :
   (a) Base year
   (b) CPI
   (c) WPI
   (d) IIP
6. What do you meant by index numbers? Discuss the importance of index numbers.

7. Calculate the cost of living index from the following data

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty. Consumer in The given year</th>
<th>Price unit (Rs.)</th>
<th>Given year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>2.5 qt × 12</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>Pulses</td>
<td>3 kg. × 12</td>
<td>0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Oil</td>
<td>2 L × 12</td>
<td>1.5</td>
<td>2.2</td>
</tr>
<tr>
<td>Clothing</td>
<td>6 metres × 12</td>
<td>0.75</td>
<td>10</td>
</tr>
<tr>
<td>Housing</td>
<td>12 months</td>
<td>20 per months</td>
<td>30 per month</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Expenditure of 10 per months</td>
<td>15 per month</td>
<td></td>
</tr>
</tbody>
</table>

(Ans. 252.8)

8. Define Consumer price index number. Explain the uses of consumer price index numbers.

9. The consumer price index for June, 2005 was 125. The food index was 120 and that of other items 135. What is the percentage of the total weight given to food?

**ANSWERS OF ONE MARK QUESTIONS**

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

2. (a) Simple index numbers
   (b) Weighted index numbers.

3. Base year is the year of reference from which we want to measure extent of change in the current year.
4. There the three consumer group for which CPI is computed
   (i) CPI for industrial worker
   (ii) CPI for urban non manual employees
   (iii) CPI for agricultural labourers.

5. A price relative is the percentage ratio of the value of a variable in the current year to its value in the base year.

6. \[ P_{01} = \frac{\sum P_1q_0}{\sum P_0q_0} \times 100 \]

7. Economic Survey

8. \[ \Pi P_{01} = \frac{\sum \left( \frac{q_1}{q_0} \right)w}{\sum w} \times 100 \]

9. There are three types of CPI.
   (i) CPI (1W)    (ii) CPI (UNME)    (iii) CPI (AL)

10. Current year is the year for which average change is to be measured or index number is to be calculated.

11. In simple index number, all items of the series are accorded equal weightage or importance but in weighted index number different items of the series are accorded different weightage, depending upon their relative importance.

12. Rate of inflation = \[ \frac{A_2 - A_1}{A_1} \times 100 \]

   Here, \( A_1 = \) WPI for week first (1)
   \( A_2 = \) WPI for week second (2)

13. P01
14. WPI indicates the change in the general price level.

15. \[ P_{oi} = \frac{\sum P_i q_i}{\sum P_o q_i} \times 100 \]

16. Consumer price index (CPI)

17. 22.02% (or) 22%

18. Three

19. Groups          Weightage
        (i) Mining          10.47
        (ii) Manufacturing  79.36
        (iii) Electricity   10.17

20. Wholesale price index number

21. Retail prices

22. Food

23. Weighted index numbers.

**Hints 3/4 Marks**

Q. No. 5 : Different people consume different types of commodities, their consumption habit is different

Q. No. 7 : Price Index shows percentage change in prices of certain goods over a time period. Quantity index shows percentage change in physical volume of production employment and construction.

Q. No. 15 : Expenses on items will be taken as weights for different items : 
FREQUENTLY ASKED QUESTION

INDEX NUMBERS

1. What is the symbol of the price of the base year? 
   
   Hint: \( P_0 \) 
   
   1 marks

2. State characteristics of index numbers
   
   Hint:
   
   (1) Expressed in numbers
   (2) Relative measure
   (3) Average of percentage
   (4) Basis for comparison
   (5) Universal utility
   
   3/4 marks

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.
   
   6 marks

INDEX NUMBER

Multiple Choice Questions

1. An Index number which accounts for the relative importance of the items is known 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 the index will be
   (a) small (b) large
   (c) uncertain

4. A consumer price index measures changes in
   (a) retail prices (b) wholesale prices
   (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)
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 Britain’s own rapidly expanding modern industrial base.

Conditions in the Indian economy on the eve of independance:

(i) Low level of economic development: The colonial govt., never made any sincere attempt to estimate India’s national and percapita income.

The estimates given by Dr. V.K.R.V. Rao-growth rate of GDP was about 2% per annum while the growth of percapita output was just 1/2 (0.5) percent per annum.

(ii) Backward agricultural sector: Due to

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-industrialisation-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 rawmaterial and importer of finished good.
   B. Britain had monopoly control on foreign trade.
   C. Drain of India’s wealth.

(v) Adverse demographic condition
   A. High death rate-45 per thousand.
   B. High infant mortality rate-218 per thousand.
   C. Mass Illiteracy-84% illiterate.
   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, railway ports, water transport post & telegraph by the British rulers. The main motive was not to provide basic amenities to the Indian people but for their colonial interest.

(vii) More dependence on primary sector
   * Largest share of work force which was 72% was engaged in agriculture.
   * 10% in manufacturing while 18% workforce were engaged inservice sector.
   * Some positive side-effectsof the British rule in India
A. Provided transport facilities, largely in terms of railway.
B. Development of ports.
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.

ONE MARK QUESTIONS

1. What was the infant mortality rate of India during British rule?
2. State the life expectancy in India during British rule.
3. What do you mean by infant mortality rate?
4. Give the name of one economist who estimated India’s per capital income during colonial period.
5. What is meant by commercialisation of agriculture?
6. Which industries were adversely affected due to partition.
7. What does the export surplus mean?
8. What percentage of India’s working population was engaged in secondary and tertiary sector during British rule?
9. The first official census in India occurred in which year.
10. At the time of Independence, literacy rate was........!

3/4 MARKS QUESTIONS

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 infrastructural change in 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.

7. Explain two fold motive of systematically de-industrialisation policy colonial Govt.

8. Explain positive effects of introduction of railways by colonial Govt. in India.

**6 MARKS QUESTIONS**

1. Critically appraise some of the shortfalls of the industrial policy pursued by the British colonial 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 218 per thousand.

2. Life expectancy was 32 years.

3. Infant mortality rate means number of deaths of children below the age of one year per thousand live births.


7. When export of a country is more than import.

8. 10% in secondary sector and 18% in tertiary sector.

9. = 1881

10. 16%

**FREQUENTLY ASKED QUESTIONS**

**INDIAN ECONOMY ON THE EVE OF INDEPENDENCE**

1. What was the infant mortality rate of India during British Rule?
   
   **Hint**: 218 per thousand live births.

2. What were the two main draw backs of the industrial sector during colonial rule? 3/4 marks
   
   **Hints**:
   (i) De-industrialisation
   (ii) Lopsided modern industrial structure
   (iii) Capital goods industries were lacking
   (iv) Limited operation of the public sector

3. What were the main causes of India’s agriculture stagnation 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.
UNIT-4
INDIAN ECONOMY (1950-90)

Economic Planning: Means utilisation of country’s resources in different development activities in accordance with national priorities.

Goals of Planning in India

<table>
<thead>
<tr>
<th>Long Term Goals</th>
<th>Short Term Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>(To be achieved over a period</td>
<td>(To be achieved over a period</td>
</tr>
<tr>
<td>of 20 years)</td>
<td>of 5 years)</td>
</tr>
</tbody>
</table>

LONG TERM GOALS I OBJECTIVES OF PLANNING

A. Modernisation - Adoption of new technology and changes in social outlook
B. Self-reliance - Reducing dependence on imports.
C. Economic Growth - Increase in the aggregate output of Goods & services.
D. Equity - Reduction in inequality of income and wealth
E. Full employment - Refers to a situation when all the people in the working age group are actually engaged in some gainful employment.

SHORT TERM GOALS / OBJECTIVES OR OBJECTIVES OF FIVE YEAR PLANS

Short term objectives vary from plan to plan depending on current needs of the country. For example first plan (1951-56) focused on higher agricultural production while in second plan (1956-61) shifted the focus from agriculture to Industry. In India growth and equity are the objectives of all the five year plans. The goal of current five year plan (12th, 2012-17) is INCLUSIVE DEVELOPMENT.
Main Features of Indian Agriculture

1. Lack of credit and marketing facilities.
2. Small and scattered holdings.
3. Poor implementation of land reforms.
4. Social environment
5. Crop losses by pest, insect, flood, draught etc.
6. Traditional inputs
7. Backward technology
8. Landlord tenant conflict
9. Low productivity
10. Disguised unemployment
11. Dependence on rainfall
12. Subsistence farming-objective of farmer is to secure subsistence for his family not to earn profit

Problems of Indian Agriculture

Technical Problems:
1. Lack of irrigation facilities.
2. Wrong cropping pattern.
3. Outdated technique of production.

Institutional Problems:
1. Pressure of population on land
2. Land degradation
3. Subsistence farming
4. Social environment
Reforms in Indian Agriculture

A. Institutional Reforms also called Land reforms.
   (i) Abolition of intermediaries.
   (ii) Regulation of rent.
   (iii) Consolidation of holdings.
   (iv) Ceiling on land holdings.

B. General reforms.
   (i) Expansion of irrigation facilities.
   (ii) Provision of credit
   (iii) Regulated markets and co-operative marketing societies.
   (iv) Support price policy.

C. Technical Reforms or Green Revolution
   (i) Use of HYV seeds
   (ii) Use of chemical fertilizers.
   (iii) Use of insecticides and pesticides for crop protection
   (iv) Scientific rotation of crops
   (v) Modernised means of cultivation.

ACHIEVEMENTS OF GREEN REVOLUTION

1. Rise in production and productivity.
2. Increase in income.
3. Rise in commercial farming.
4. Impact on social revolution-use of new technology HYV seeds, fertilizers etc.
5. Increase in employment.
FAILURES OF GREEN REVOLUTION

1. Restricted to limited crops and areas such as two crops wheat & rice growing states like Punjab, Haryana, U.P. and Andhra Pradish.
4. Increase in income disparity between small and big farmers
5. Ecological degradation.

INDUSTRY

ROLE OF INDUSTRIAL SECTOR IN INDIA

Industrialisation is important for an overall growth of a country. Following points highlight the importance of Industry is an economy:

1. Provides employment.
2. Raises national income.
3. Promotes regional balance.
4. Leads to modernisation.
5. Helps to modernise agriculture.
8. Key to high volume of exports.

* Industrialisation is a pre-condition for the final take-off of an economy.

INDUSTRIAL DEVELOPMENT SINCE INDEPENDENCE 26.4.2010-11

Share of industrial sector in the GDP has increased up to 20% in 2013-14.
The following important changes have taken place:

(i) Development of infrastructure like power transport, communication, banking & finance, qualified and skilled human resource.

(ii) Much progress in the field of research and development.

(iii) Expansion of public sector.

(iv) Building up of capital goods industry.

(v) Growth of non-essential consumer goods industries.

PROBLEMS OF INDUSTRIAL DEVELOPMENT IN INDIA

1. Sectoral imbalances-agriculture and infrastructure have failed to provide the support to the industrial sector.

2. Regional imbalance-restricted to few states.

3. Industrial sickness-which raised the problem of unemployment.

4. Higher cost of industrial product due to lack of healthy competition.

5. Dependence on the Government-for reduction in tax or duty to make import easier.

6. Poor performance of the public sector

7. Underutilisation of capacity.

8. Increasing capital-output ratio

ROLE OF PUBLIC SECTOR/GOVT. IN INDUSTRIAL DEVELOPMENT

Direct intervention of the state was considered essential in view of the following factors:

1. Lack of capital with the private entrepreneurs.

2. Lack of incentive among the Pvt. entrepreneurs-low demand due to limited size of the market.
3. Socialistic pattern of society-main aim of Govt. is to generate employment rather than profits.
5. Development of backward areas.
6. To prevent concentration of economic power.
7. To promote import substitution.

INDUSTRIAL POLICY RESOLUTION (IPR) 1956

Industrial policy is an important instrument through which the govt. regulates the industrial activities in an economy.

The 1956 resolution laid down the following objectives of industrial policy.

(a) To accelerate the growth of industrialisation.
(b) To develop heavy industries.
(c) To expand public sector.
(d) To reduce disparities in income and wealth.
(e) To prevent monopolies and concentration of wealth and income in the hands of a small member of individuals.

FEATURES OF INDUSTRIAL POLICY RESOLUTION (IPR) OF 1956

Features of Industrial policy resolution of 1956 were.

1. New classification of Industries: Industries were classified into three schedule depending upon role of state.
   (a) Schedule-A-17 industries listed in schedule-A whose future development would be the responsibility of state.
   (b) Schedule-B-12 industries were included in schedule-B, Private sector could supplement the efforts of the Public Sector, with the state taking sole responsibility for starting new units.
(c) Schedule-C-other residual industries were left open to private sector.

2. Stress on the role of cottage and small scale industries.

3. Industrial licensing: Industries in the pvt. sector could be established only through a licence from the government.

4. Industrial concessions—were offered-pvt. entrepreneurs for establishing industry in the backward regions of the country. Such as tax rebate and concessional rates for power supply.

**SMALL SCALE INDUSTRY (SSI)**

A small scale industry is presently defined as the one whose investment does not exceed Rs. 5 crore.

**CHARACTERISTICS OF SSI OR ROLE OF SMALL SCALE INDUSTRIES**

1. Labour intensive—employment oriented

2. Self-employment.

3. Less capital intensive.

4. Export promotion.

5. Seed beds for large scale industries.

6. Shows locational flexibility.

**PROBLEMS OF SMALL SCALE INDUSTRIES**

1. Difficulty of finance.

2. Shortage of raw material.

3. Difficulty of marketing.

4. Outdated machines & equipments

5. Competition from large scale industries.
FOREIGN TRADE

At the time of independence raw material was exported from India to Britain in abundance on the other hand finished goods from Britain were imported into India.

Notably our balance of trade was favourable (exports > imports)

After independence India’s foreign trade recorded a noticeable change such as.

(i) Decline in percentage share of agricultural exports.

(ii) Increase in percentage share of manufactured goods in total exports.

(iii) Change in direction of export trade and import trade.

(iv) Decline of Britain as main trading Partner.

TRADEPOLICY

In the first seven five year plans of India, the trade was commonly called an 'inward looking' trade strategy.

This strategy is technically known as ‘import substitution’ Import substitution means substituting imports with domestic production. Imports were protected by the imposition of tariff and quotas which protect the domestic firms from foreign competition. Impact of Inward looking Trade strategy on the domestic industry.

1. It helped to save foreign exchange by reducing import of goods.

2. Created a protected market and large demand for domestically produced goods.

3. Helped to build a strong industrial base in our country which directly lead to economic growth.
Criticism of import substituting strategy

1. It did not lead to growth.
2. Lack of competition implied lack of modernisation.
4. It did not lead to efficiency.

INDUSTRIAL LICENSING

Licensing is a tool for channelising scarce resources in predetermined priority sector of an economy.

The Industries development and resolution act (IDRA) was enacted in 1951.

MAIN OBJECTIVES OF IDRA act of 1951

1. Regulation of industrial development in accordance with planned priorities.
2. Avoidance of monopoly.
4. Prevention of undue competition between large-scale industries and small scale industries.
5. Optimum utilisation of scarce foreign exchange resoures. Under this act the following were applicable.
   A. All the scheduled industries should be registered with the govt.
   B. A licence must be obtained by all the new industries.
   C. Govt. is authorised to examine the working of any industrial undertaking.
D. If the undertaking continued to be mismanaged, govt can take over its management.

CRITICISM AGAINST INDUSTRIAL LICENSING

1. There was an adhoc system for accepting or rejecting an application for licence.

2. The quality of techno economic examination conducted by Director General of technical development was generally poor.

3. Licensing policy resulted in under utilisation of capacity in many industries.

4. In reality the policy helped large business houses in accumulating economic power.

PERMIT LICENCE RAJ

The licensing authorities many a times granted licence to big business houses without proper scrutiny of their applications.

ONE MARK QUESTION

1. Define economy.

2. Who is the chairman of the planning commission in India?

3. What was the idea behind abolition of intermediaries?

4. Write the classification of industries according to IPR-1956.

5. What do you mean by green revolution?

6. What is meant by small scale industries?

7. What is marketable surplus.
8. Who formulates five year plans in India.

9. Write the duration of current five year plan.

10. Name any two Common goals of five year plan.

11. Name the type of economy adopted in India.

12. Define modernisation.

13. What is import-substitution?

3/4 MARKS QUESTIONS

1. Explain how import substitution can protect domestic industry.

2. Why was public sector given a leading role in industrial development during the planning period?

3. How subsidies encourage farmers to use new technology? explain.

4. What were the benefits of green revolution.

5. Explain the Importance of “Socialist Pattern of Society” in Economic Planning in India.

6. Small scale industries promote rural development, explain.

7. Write the limitation of green revolution.

8. What are the main goals of the five year plans in India?

6 MARKS QUESTIONS

1. Explain the problems of industrial development in India.

2. Explain the role of small scale industries in the socio economic development of our country.

3. How did green revolution benefit and harm the farmers?
4. Describe the objectives and main features of industrial policy resolution 1956.

5. What is import substitution policy? Why was it adopted in the initial period of development in India?

6. Describe the achievements and failures of economic planning in India.


**ANSWER OF ONE MARK QUESTIONS**

1. It is organisation of economic activities which provides people with the means to work and earn a livlihood.

2. Prime minister is the chairman of planning commission in India.

3. The aim of abolition of Zamindar was to make direct link between government and real cultivators so that cultivators can get maximum profit.

4. Classification of industries according to IPR 1956 was.
   
   (a) Schedule ‘A’ includes 17 industries governed by public sector.

   (b) Schedule ‘B’ includes 12 industries governed by public & pvt. sector both.

   (c) Schedule ‘C’ includes other residual industries under pvt. sector.

5. Green revolution refers to the tremendous increase in agricultural production and productivity with the introduction of new technology.

6. Small scale industries are those in which the investement limit is Rs. 5 crores.

7. Marketable surplus means production sold in the market after self consumption by the farmers.
8. Planning commission.
10. Growth and equity.
12. Modernisation means Adoption of new technology & change in social outlook.
13. Import substitution means encouraging domestic production of such goods which the country is importing.

**FREQUENTLY ASKED QUESTIONS**

**INDIAN ECONOMY 1950-1990**

1. Who formulates plans in India?  1 Mark
   
   Hint: Planning Commission.

2. What were the limitation of green revolution  3/4 Marks
   
   (i) Restricted to limited crops and areas.
   
   (ii) Partial removal of poverty
   
   (iii) Increases Income inequality between rich and poor farmers
   
   (iv) Ecological degradation.

3. Describe the achievements and failures of economic planning in India  
   
   (6 Marks)

   Hint

   **ACHIEVEMENTS:**

   (1) Diversified Industrial base.

   (2) Increase in National Income and Per Capita Income.
(3) Self Reliance in food Production.

(4) Abolertion of intermediatry + tennacy reforms

**Failures:**

(1) Jobless Growth

(2) Stagmart Occupational Structure

(3) Poor Performance of Public Sector

(4) Look of Strong Export Sector

(5) Increase in regional Inequalities
UNIT-4
ECONOMIC REFORMS SINCE 1991

Key Points:

Economic Reforms:

Economic reforms or structural adjustment is a long term multi dimensional package of various policies (Liberalisation, privatisation and globalisation) and programme for the speedy growth, efficiency in production and make a competitive environment. Economic reforms were were adopted by Indian Govt. in 1991.

Factor’s responsible for Economic reforms.

1. Fall in foreign exchange reserve: as imports grew faster than exports
2. Adverse balance of payments resulted repayment crisis
3. Mounting fiscal deficit as govt. expenditure grew faster than revenue
4. Rise in prices, which has negative impact on Investment.
5. Failure of public enterprises very low return on high Investment
6. Gulf crisis increases crude oil prices which negatively affected BOP.

Measures of New Economic policy

Stabilisation measures: These are short run measures introduced by Govt to control rise in price, adverse balance of payment and fall in foreign exchange reserve.

Structural adjustment: These are long run policies. The goal of structural reforms is to abolish controls, eliminate bureaucratic hurdles, and redtapism and make the decision making process efficient and transparent.
In the new economic policy 1991, Structural reforms can be seen with respect to.

1. Liberalisation.
2. Privatisation

**Liberalisation**

Liberalisation means removing all unnecessary control and restrictions like permits licenses, protectionist duties quotas etc.

**Economic reforms under liberalisation.**

1. Industrial sector reforms
2. Financial secto reforms.
3. Fiscal reforms.
4. Foreign exchange reforms.
5. Trade and investment reforms.

**Privatisation**

Privatisation is the general process of involving the private sector in the ownership or operation of a state owned enterprises.

Policies adopted for privatisation

1. Contraction of public sector.
2. Abolish the ownership of Govt. in the management of public enterprises.
Globalisation

Globalisation may be defined as a process associated with increasing openness growing economic interdependence and deepening economic integration in the world economy.

Policy promoting globalisation.

1. Increase in equity limit of foreign investment.
2. Partial convertibility.
3. Long term trade policy.
4. Reduction in tariff.

An Appraisal of LPG Policies

1. Increase in foreign investment.
2. Increase in foreign exchange reserves.
3. A check of inflation.
4. Increase in national income.
5. Increase in exports.
6. Consumer sovereignty.

Negative Impact.

1. Neglect of agriculture.
2. Jobless growth.
3. Increase income inequalities.
4. Adverse effect of disinvestment policy.
5. Spread of consumerism.
6. Cultural erosion.
1 MARK QUESTIONS

1. State the meaning of economic reforms.
2. How does increase in fiscal deficit creates the requirement of economic reforms?
3. State the name of economic reform which makes economy, free from direct or physical controls imposed by the Govt.
4. What is meant by foreign exchange reserve?
5. Why the requirement of fiscal reforms arose under liberalisation?
6. What is meant by direct tax?
7. Define indirect tax with the help of example.
8. What is meant by devaluation?
9. State the meaning of privatisation.
10. What is meant by globalisation?
11. What benefit goes domestic Industries by reduction in tariff?

3/4 MARKS QUESTIONS

1. What is meant by economic reforms? Write the measures adopted under economic reforms.
2. What is meant by adverse balance of payments. How does adverse balance of payments creates the requirement of economic reforms?
3. How the insufficient production of public sector enterprises become a main cause of adoption of economic reforms?
4. Differentiate between stabilization measures and structural adjustment under NEP.
5. Define privatisation. State the measures adopted for privatisation.
6. Explain the meaning of globalisation and as the main result of this policy explain the outsourcing.

7. Explain various types of industrial reforms under liberalisation.

5/6 Marks questions


2. Explain the measures taken for globalisation of economy.

3. Satate the meaning of liberalisation and explain the measures adopted for liberalisation.

4. Explain the positive impact of economic reforms over Indian economy.

5. Explain the negative impact of economic reforms.

ANSWER OF ONE MARKQUESTIONS

1. Economic reforms refers to those measures which are adopted for the speedy growth of economy, efficiency in production and make.

   (a) Competitive environment.

2. Due to increasing fiscal deficit the interest paid by the Govt. for the borrowings become 36.4% of the Govt. expenditure. So economic reforms become essential for the Govt.

3. Liberalisation.

4. Stock of foreign currency held with the Govt. at given point of time called foreign exchange reserve.

5. Prior to liberalisation, tax structure was highly complicated and evasive. Fearing a heavy burden of taxation it promote evasion of tax, so tax reforms become essential for the.

6. Direct taxes are those taxes, the burden of which can not be shifted on other’s eg. Income tax.
7. Indirect taxes are those taxes the burden of which can be shifted on other for example sales tax.

8. Develuation refers to lowering in the official value of a currency with respect to gold or foreign currency.

9. Privatisation is the general process of involving the private sector in the ownership of operation of a state owned enterprises.

10. Globalisation may be defined as a process associated with increasing openness growing economic interdependence and deepening economic integration in the world economy.

11. Due to reduction in tariff, imports becomes cheaper and profit margin increase on exports for domestic industries.

**FREQUENTLY ASKED QUESTIONS**

**ECONOMIC REFORMS SINCE 1951**

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-tariff barrier.
   
   (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

Key points :

- **Poverty** is the inability to fulfill the minimum requirement of life like food, clothing, housing education and health facilities etc.

- **Relative poverty** refers to poverty of people in comparison to other people in different region or nations.

- **Absolute poverty** refers to total number of people living below the poverty line.

- **Poverty line** refers to that line which express per capita average monthly expenditure that is essentially required by the people to satisfy their minimum needs. As per Tendulkar committee, poverty line is estimated in monthly basis as Rs. 816 in rural areas and Rs. 1000 in urban areas. People who are not able to earn even such amount in a month are considered below poverty line.

- According to a survey, approx. 22% population in India is blow poverty line.

**Estimation of poverty line :**

Calories based estimation— For rural area intake calorie was estimated at 2,400 calories and for urban area it is 2,100 calories,

In 1999-2000 new ways of measuring started i.e. monthly per capita expenditure— it estimates for rural area as consumption worth Rs. 816 per persons and for urban areas it is Rs. 1000 Presently as per Tendulkar committee.
Three approaches of govt to combat poverty.

Approach

| Enhancing Economic Growth | Specific Programmes for Poverty Alleviation | Fulfilling Minimum Needs of the poor |

Causes of Poverty:
1. Rapid increase in population.
2. Low level of National product.
4. Unemployment.
5. Low rate of growth.

Measures adopted by the Government to remove poverty.
1. Food for work programme.
2. Swarnjayanti Gram Swarojgar Yojana.
3. Pradhan Mantri Gramodoya Yojana.
4. Sampoorna Gramin Rozgar Yojana.
5. Swarn Jayanti Shahri Rozgar Yojana.

Poverty
1. Mark Questions
   1. Define poverty.
   2. How does absolute poverty measured in India?
3. Define poverty line.

4. What is “food for work” programme?

5. A cut-off point (usually in term of per capita expenditure) which divides people of a region as poor and non-poor is called:
   (a) absolute poverty  (b) chronic poverty
   (c) relative poverty  (d) poverty line

6. Those people who are moving in and out of poverty are called:
   (a) Transient poor  (b) Non-poor
   (c) chronic poor  (d) None of these

7. Give two example of self employment programme.

½ 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 the relation of poverty and inequalities.

4. How poverty line is measured in India?

5. Economic equality and GDP growth may not move in the same direction. Comment.

6. Sickness and inefficiency are related to poverty. how?

7. Unequal distribution of income is a reason of poverty in India.

6 Marks questions

1. Explain briefly the causes for poverty.
2. Give the critical assessment of poverty alleviation programmer.

3. Explain briefly the measures adopted by the Government to remove poverty.

**HOTS**

1. What is vicious circle of poverty.

2. Nation rural employment guarantee Act has been playing major role in eradicating poverty in India comment.

3. Do you think that urban poverty is spillover of rural poverty. Give reasons in support of your answer.

4. ‘Answer to poverty does not lie in providing food to the poor, it lies in empowering the poor for self-employment comment.

**ANSWER OF ONE MARK QUESTIONS**

1. Poverty is the inability of fulfilling the minimum requirement like food, clothing, housing, education and health facilities etc.

2. Absolute poverty is measured in India with the help of poverty line.

3. Poverty line refers to that line which express per capita average monthly expenditure incurred by the people to satisfy their minimum needs.

4. National food for work programme was the programme which aims at increasing food security through wage employment in the drought affected rural areas in India.

5. Poverty line.

6. Transient poor.

7. (i) Swarnjayanti gram swarozgar yojana

    (ii) Pradhanmantri gramodaya yojana.
UNIT-5
HUMAN CAPITAL FORMATION IN INDIA

Points to Remember

- **Human capital** refers to the stock of skill, ability, experties, education and knowledge in a nation at a point of time.

- **Human capital formation** is the process of adding to the stock of human capital over a period of time.

- **Sources of human capital formation.**
  
  (i) Expenditure on education.
  
  (ii) Expenditure on health.
  
  (iii) On the job training.
  
  (iv) Study programmes for adults.
  
  (v) Migration and expenditure on information.

- **Role of human capital formation in economic growth.**
  
  (i) Raises production
  
  (ii) Change in emotional and physical environment of growth.
  
  (iii) Improves quality of life.
  
  (iv) Raises life expectancy.
  
  (v) Innovative skills.
  
  (vi) Raises social justice and equality.

- **Problems facing human capital formation.**
  
  (i) Rising population
  
  (ii) High regional and gender inequality.
(iii) Brain drain
(iv) Insufficient man power planning.
(v) Insufficient on the job training in agriculture
(vi) High poverty levels
(vii) Low academic standards.

• Importance and objectives of education

(i) Education produces good citizens.
(ii) Education facilitates use of resources in the country.
(iii) Develops science and technology.
(iv) Expands mental horizon of the people.
(v) Promotes cultural standard of the citizens.
(vi) Develops human personality.

• Problems relating to development of education in India.

(i) Large number of illiterates.
(ii) Inadequate vocationalisation.
(iii) Gender bias.
(iv) Low rural access level.
(v) Low government expenditure on education.

Human capital formation in India

(i) The seventh five year plan stressed upon the importance of human capital.
(ii) In India, ministry of education at the centre and state level, NCERT (National Council of Educational Research and Training), UGC (Uni-
versity Grant commission), AICTE (All India Council of Technical Education) regulate the education sector.

(iii) In India, Ministry of Health at the Union and the State level and ICMR (Indian Council of Medical Research) regulate the health sector.

(iv) World Bank states that India will become the knowledge economy. Also if India uses its knowledge as much as Ireland does, than the per capita income will rise by $ 3000 by the year 2020.

**Interrelationship between human capital formation and economic growth**

Human capital formation raises the process of Economic Growth and economic growth raises the process of human capital formation.

(i) **Rise in human capital raise economic growth**

Rise in Human Capital

↓

Modern attitude and outlook, better quality of life, Higher life expectancy

↓

More Efficiency

↓

More Production

↓

More economic growth
(ii) **Rise in economic growth raises human capital formation**

Rise in Economic Growth  
\[\downarrow\]  
Rise in per capita income  
\[\downarrow\]  
More investment in education and health  
\[\downarrow\]  
Rise in human capital

**EDUCATION SECTOR IN INDIA**

1. **Elementary education**:

   (A) Elementary education covers students from class 1 to class 8 (primary and middle) in the age-group of 6 to 14 years. The number of primary and middle schools has considerably increased from 2.23 lakh (in 1950-51) to 11.92 lakhs (in 2011-12). Nearly about 97% children in the age-group of 6-14 years have been receiving education in schools.

   (B) 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**:

   (A) As per a survey number of secondary and senior secondary schools rose to 2.12 lakhs and number of students getting education at this level rose up to 482 lakhs.
(B) At central level, Navodaya schools and Kendriya Vidyalayas are playing a vital role in promoting education at this level.

3. Higher education:

(A) As per a survey in India near about 665 universities are imparting education at higher level and number of collages importing general education is 35829.

(B) Number of students getting higher education is about 130 lakhs.

4. In addition to it, since independence, the number of institutions importing technical and professional education has increased significantly in India in which polytechnical institutions, engineering colleges, medical collages, research centres like IIT, agriculture research institute, India statistical institute, IIM etc. are various proper.

**HUMAN CAPITAL FORMATION IN INDIA**

1 Mark Questions

1. As per census 2011, literacy rate in India is about:

   (a) 74 per cent        (b) 56 per cent
   (c) 65 per cent        (d) 60 per cent

2. Which of the following organisations is engaged in designing text material up to the senior secondary level.

   (a) UGC           (b) AICTE
   (c) ICMR          (d) NCERT

3. The ability to read and write is known as:

   (a) Education      (b) Human capital
   (c) Literacy       (d) Human development
4. What is meant by human capital formation?
5. Define human capital.
6. Which five year plan recognised the importance of human capital?
7. Why do we need to invest in human capital?
8. What is on-the-job training?
9. Name the movement started by national literacy mission.
10. What is meant by training?

¾ Marks Questions
1. What are three major source of human capital formation?
2. Explain the concept of human capital formation.
3. Discuss the growth in government expenditure on education. What does it indicate?
4. Whom do you call literate? How is literacy different from education?
5. How migration promotes human capital formation?
6. Explain how educational planning is necessary for human capital formation.
7. Explain the role of human capital in economic development.
8. Differentiate between human capital and physical capital.
10. How is human capital formation helpful in reducing inequality in income?

6. Marks questions
1. Explain how education is still a challenging proposition in India?
2. Human capital and economic growth reinforce each other elaborate this statement.

3. Discuss how education is an important input for the development of the nation

4. Discuss the principle difficulties in the process if human capital formation in India

5. Give adult and female education position in our country

6. Bring out the need for the on the job training in agricultural sector of India.

7. Discuss the need for promoting women’s education in India

HOTS

1. How do you justify the need for government intervention in promoting health and education in India?

2. How does human capital formation raise social justice?

Answers of one mark question

1. 74 percent

2. NCERT

3. Literacy

4. Human capital formation refers to the process of adding to the stock of human capital overtime.

5. Human capital is the stock of ‘skill and expertise’ of a nation at a point of time.

6. Seventh five year plan.
7. It is necessary to invest in human capital in an efficient manner and to develop man’s ability to increase productive capacity of a country.

8. On the job training refers to the training providing to the works by the firm to enhance their specialized skill. It makes then more efficient and productive.

9. Education for all

10. Training means to provide skill and knowledge for doing specific work. It increase efficiency.
UNIT 5
RURAL DEVELOPMENT

- Rural development is an action plan for the economic and social upliftment of rural areas.

- Key issues in rural development.
  
  (i) A robust system of rural credit.
  
  (ii) A system of marketing that ensures remuneration price to the farmer for his produce.
  
  (iii) Diversification of crops that reduces risks of production and induces commercialisation of farming.
  
  (iv) Diversification of production activity with a view to find alternative means of sustainable living other than crop-cultivation.
  
  (v) Promotion of organic farming with a view to make crop cultivation environmentally friendly as well as a sustainable process over a long period of time.

- Rural credit means credit for the farming families. Farmers require credit for various purposes like purchasing agricultural tools and machines, digging wells and tubewells, purchasing seeds, fertilizers, pesticides, etc.

- Sources of rural credit in India.
  
  1. Non-institutional sources are money lenders, traders and commission agents, landlord, relatives and friends.
  
  2. Institutional sources are as follows:
     
     (i) Co-operative credit societies.
     
     (ii) Commercial Banks
     
     (iii) Regional banks
(iv) NABARD (National Bank for Agriculture and Rural Development.) (established in 1982)

(v) Self Help Groups (SHGs)

The above institutional structure of rural banking which is called multi-agency system which has initiated by govt. in 1969.

Agricultural marketing means all those activities which includes-gathering the produce after harvesting, processing the produce, grading the produce according to its quality, packaging the produce according to preferences of buyers, storing the produce for future sale and selling the produce when price is lucrative.

- **Defects of agricultural marketing**
  - (i) Inadequate warehouses
  - (ii) Multiplicity of middlemen
  - (iii) Malpractices in unregulated markets.
  - (iv) Lack of Adequate finance
  - (v) Inadequate means of transport and communication.

- **Measures adopted by the government to improve marketing system.**
  - (i) Regulated markets.
  - (ii) Co-operative agricultural marketing societies.
  - (iii) Provision of warehousing facilities.
  - (iv) Subsidised transport.
  - (v) Dissemination of marketing information.
  - (vi) Buffer stocks and minimum support price (MSP)
  - (vii) Public Distribution System (PDS)
Diversification in agriculture activities-It has two aspects.

1. **Diversification of crop production** refers to a system of multiple cropping rather than mono cropping. It has two advantages.
   (i) It lowers the risk of farmer on account of failure of monsoon.
   (ii) It enhances the scope for commercialisation of farming.

2. **Diversification of productive activities** implies a shift from cropfarming to non-farming areas of employment. Non-farm areas of employment include.
   (i) Animal husbandry.
   (ii) Fisheries.
   (iii) Horticulture.
   (iv) Cottage and household industry.
   (v) Information technology-every village a knowledge centre.

- **Organic farming** is a system of farming that maintains, enhances and restores the ecological balance. It helps in sustainable development in the agricultural sector. In organic forming, farmers use organic manures, biofertilizers and organic pesticides.

- **Advantages of organic farming**:
  (i) Inexpensive process.
  (ii) Generates income.
  (iii) Healthier and tastier food.
  (iv) Solves unemployment problem.
  (v) Environment friendly.

Organic farming involves labour-intensive process of production of labour so India has comparative advantage in organic farming.
• **Operation Flood**

It is a system of milk co-operatives, launched in 1966. This system emphasised the pooling of milk by farmers through co-operatives societies. This increased the quantum of sale as well the market value of product. The production is milk increased four-fold. This system if commonly called operation flood.

**RURAL DEVELOPMENT**

**1 Mark Questions**

1. The period of short terms loans is:
   (i) upto 1 year (ii) 1 to 2 years (iii) upto 3 years (iv) upto 5 years
2. In which year nationalization of commercial bank was done first time
   (i) 1957 (ii) 1960 (iii) 1969 (iv) 1980
3. Which of the following is not related to agricultural marketing?
   (i) Storage (ii) Labeling (iii) Processing (iv) Use of chemical fertilizers
4. What is rural development?
5. What is meant for agricultural diversification?
6. What s Co-operative marketing?
7. What is agricultural marketing?
8. Mention two limitations of rural banking?
9. When was NABARD established?

**3 Marks Questions**

1. Name three institutional sources of agricultural credit.
2. Evaluate the rate of NABBRD in the context of rural development.
3. Give two basic objectives of the co-operative credit societies.

4. Explain the importance of self help Groups (SHGS) in rural areas.

5. Why is state intervention necessary to regulate the activities of private traders in the rural agricultural sector?

6. How has horticulture encouraged Indian rural development?

7. Why does Indian farmer need credit?

8. What are the advantages of organic farming?

9. Why has rural banking not able to give adequate credit to farmers?

10. What do you understand by-
    
    (i) MSP (Minimum Support Force)
    
    (ii) Buffer stock
    
    (iii) PDS (Public Distribution System)
    
    (iv) SHG (Self help Group)

6 Marks Questions

1. What do you mean by agricultural diversification? Why is it required?

2. What steps have been initiated by the government to improve agricultural market system in India?

3. What do you understand by the term rural development? What are the key issues of rural development?

4. Explain the types of credit taken by farmers for different purposes . Bring out the significance and implications of non-institutional credit.

HOTS

1. Explain how animal husbandry, fisheries and horticulture are a significant source of sustainable livelihood in rural areas.
2. Explain how far Information Technology can be relied upon a source of sustainable living in rural areas.

Answer to One Mark Questions

1. upto 1 year
2. 1969
3. Use of chemical fertilizers
4. Rural Development is an action plan for the economic and social upliftment or rural areas.
5. Agricultural Diversification means a major proportion of the increasing labour force in the agricultural sector needs to find alternate employment opportunities in other non-farm sectors.
6. Co-operative marketing is a measure to ensure a fair price to farmers. Member farmers sell their surplus to the Co-operative society which substitutes collective bargaining in place of individual bargaining and hence provides best advantage to the farmers.
7. Agricultural marketing is a process of marketing in which farm produce are distributed through wholesalers and stockists to ultimate consumers.
8. Two limitation of rural banking are inadequate finance and negligence of marginal farmers.
9. 1982
UNIT-5
EMPLOYMENT : GROWTH INFORMALISATION AND OTHER ISSUES

- 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.
- An economic activity refers to the activity performed by people to earn the living. The main three types of economic activities are consumption, production and distribution.
- Production activity refers to all those activities which are undertaken to produce goods and services for generation of income.
- Labour force: All persons, who are working (have a job) and those are not working but able to work and willing to work at the existing wage rate constitute labour force.
- Labour Force: Persons working + persons seeking and/or available for work.
- 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. This includes person between age group of 15-60 years.
- 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 days of work. One man day refers to 8 hours of work.
• Participation Rate = \( \frac{\text{Workforce}}{\text{Total Population}} \times 100 \)

Types of workers

- (a) Self employed
- (b) Hired workers
  - Casual Workers
  - Regular Workers
  - (Salaried)

- About two fifth of the total population in the country is engaged in various economic activities.
- Men particularly rural men, 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 and informalisation of employment**: 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 more 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.
• **Unemployment Rate**: It is calculated as percentage of labour force who are unemployed, not as percentage of total population.

![Types of unemployment diagram]

- Rural unemployment
  - Seasonal Unemployment
  - Disguised Unemployment

- Urban Unemployment
  - Industrial Unemployment
  - Educated Unemployment

Other types of unemployment

- Open
- Frictional
- Structural
- Cyclical

• **Causes of unemployment**
  - Slow rate of economic growth
  - Population explosion
  - Underdeveloped agriculture
  - Defective educational system
  - Slow growth of Industry
  - Decline of cottage and small industry.
  - Faulty planning
  - Inadequate employment planning.
  - Low capital formation.

• **Remedial measures for unemployment.**
  - Accelerating growth rate of GDP
  - Control of population growth
Development to small scale enterprises.
Encouragement in infrastructure.
Special employment programmes.
Rapid industrialisation.

- **Special programmes to fight poverty and unemployment**
  Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA)
  Its a significant recent attempt of govt, offering guaranteed employment to
  those in the rural areas who are below poverty line.
  - Swarnjyanti sahari Rozgar yojna.
  - Swarnjyanti Gram Swarozaar yojna.
  - Pradhan Mantri Gram daya Rozgar yojna.

**EMPLOYMENT AND UNEMPLOYMENT**

1 Mark Question

1. Number of persons unemployed = ______________ Work force
   (i) Supply of labour               (ii) Total population
   (iii) Labour force               (iv) Participation rate

2. Unemployment arising from economic fluctuations is called
   (i) Disguised Unemployment       (ii) frictional unemployment
   (iii) Seasonal Unemployment      (iv) Seasonal Unemployment

3. Who is worker?

4. Define GDP

5. Define self employed workers
6. Define Participation rate
8. Define Casualisation of employment
9. What is informalisation of workforce?
10. Give the meaning of disguised unemployment
11. What is workforce?
12. Who is casual wage labourer?

**3/4 Marks Questions**

1. What is difference between labour force and work force?
2. Analyse the recent trends in sectoral distributing workforce in India.
3. Empowerment of women is related to employment of women. Comment (Multi Disciplinary)
4. GDP in India is growing nearly at the rate of 7-8 percent. but rate of unemployment is not reducing. Why? (Multi Disciplinary)
5. Discuss the two types of rural unemployment
7. What are the adverse effects of unemployment
8. Suggest general measures to control unemployment
9. What are the problems being faced by the workers of informal sector?

**6 Marks 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 the organised sector

**HOTS**

1. Unemployment in India has several dimensions. Express your views on this statement.

2. In India, primary sector continues to be a significant source of employment, dispute some shifts in favour of secondary and territory sectors. How do you explain this phenomenon?

**Answer to one mark question**

1. Labour force

2. Cyclic unemployment

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

4. Sumtotal of the goods and services produced in the economy during a year is called GDP.

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

6. Participation rate is defined as the percentage of total population which is actually participating in productive activity. It is also called worker population ratio.

7. 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
8. Casualisation of employment is defined as a situation in which percentage of casually hired workers in the workforce tends to grow overtime.

9. Informalisation of work force refers to a situation whereby the proportion of workforce in the informal sector to total workforce increases.

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

11. The number of persons, who are actually employed at a particular time are known as work force.

12. Workers who are not hired by their employers on a regular or permanent basis (i.e. do not have job security) and do not get social security benefits, are formed as casual wage labour.
UNIT 5
INFLATION : PROBLEM AND POLICIES

- By inflation in ordinary language, we mean a process of rising prices. Inflation is a situation of persistent and appreciable rise in prices, leading to fall in purchasing power of money. A chief measure of price inflation is the inflation rate. It is the annualized percentage change in a general price index over time.

- Demand Pull Inflation: Demand-pull inflation arises when there is an excess of demand for goods over their supply. When there is persistent increase in demand and supply does not increase proportionately then prices tends to rise.

- Causes of demand pull Inflation are
  Increase in public expenditure.
  Increase in investment.
  Increase in money supply
  Growth in black money
  Increase in population

- Cost push inflation: Cost push inflation occurs when rise in price is due to rise in the cost of production. In this type of inflation, demand factor plays an minor and supply factor plays an important role. Once, this type of inflation sets in one industry, it spreads to all other industries of an economy.

- Main causes of cost-push inflation are
  Higher wage rate
  Higher profit margin
Higher taxes
Fall in the availability of basic inputs
Administered higher prices of inputs.

**Causes of inflation**

1. **Demand factors**
   - Growth of population
   - Rise in employment and income
   - Increase in pace of urbanisation.

2. **Supply factors**
   - Irregular agricultural supply
   - Hoarding of essential goods.
   - Rise in administered prices.
   - Agricultural price policy
   - Rising prices of imports
   - Inadequate growth of industrial production.

3. **Monetary and fiscal factors**
   - Rising levels of government expenditure.
   - Deficit financing.

**Effect of Inflation**

**Micro-on Individual**
- Real income declines
- Wealth value declines
- Income redistribution causes social tensions.
Macro-On Economy

- Hoarding and black marketing.
- Speculation increases
- Nominal pay increase
- Higher tax bracket.
- Deterioration of quality of goods and standard of living.

- **Policy measures to control inflation**

  (a) **Monetary measures**

  - A check on the supply of money
  - Increases in rate of interest
  - Decrease in the supply of credit
  - By raising cash reserve ratio and statutory liquidity ratio and by open market operations

  (b) **Fiscal Measures**

  - A check on the public expenditure
  - Increase in taxes
  - Public borrowings

  (c) **Physical or non monetary measures**

  - Increasing output or increasing imports
  - Controlling money wages
  - Price control and rationing.
  - Check on hoarding.
INFLATION

1 Mark Question

1. When price level tends to rise owing to the rising income, level, it is called:
   (i) Cost push inflation (ii) Consumer inflation
   (iii) Demand Pull inflation (iv) None of these

2. Which of the following is not a cause of inflation?
   (i) Rise in population (ii) Increase in wages
   (iii) Deficit financing (iv) Decrease in money supply

3. Define inflation

4. Which demand factors causes inflation?

5. Which supply factors cause inflation?

6. What is demand pull inflation?

7. What is cost pull inflation?

8. What is inflation rate?

9. Who controls and monitor monetary policy in India?

10. What is fiscal policy?

3/4 Marks Questions

1. Explain monetary measures to control inflation.

2. Explain fiscal measures to control inflation.

3. What are the major impact of inflation on the economy?

4. Analyse the impact of fall in crude oil in the international market on the purchasing power of a common man in India.
6 Marks Questions

1. What have been general causes of inflation in India?
2. What are the measures taken by the Government to tackle inflation?
3. What is the impact of inflation on the economy?

HOTS

1. In the recent past RBI has lowered repo rate twice by 0.25 percent. Analyse its possible impact on the general price level.
2. Analyse the impact of fall in crude oil price in the international market on the purchasing power of a common man in India.
3. High rate of inflation is a road block in the flow of FDI. How do you justify this statement.

Answer to One Mark Questions

1. Demand Full Inflation
2. Decrease in money supply
3. Inflation is a situation of persistent and appreciable rise in prices, leading to fall in purchasing power of money.
4. Growth in population rise in employment and increasing pace of urbanisation cause inflation.
5. Hoarding of essential goods, irregular agricultural supply rise in administrated prices and inadequate growth of industrial production are some of the supply factors which cause inflation.
6. Demand pull inflation means inflation arises due to excess of demand for goods over their supply.
7. Cost push inflation means rise in price level due to rise in cost of product
8. Inflation rate is annualized percent change in a general price index over time. It is a chief measure of price inflation.

9. Reserve Bank of India

10. Fiscal policy is the expenditure and revenue policy of the government.
UNIT 5
INFRASTRUCTURE

Points to Remember

- **Infrastructure** refers to all such services and facilities, which are needed to provide different kinds of services in an economy and which are essential in raising the place of economic growth of a country.

- It contributes to economic development of a country both by raising the productivity of factors of production and improving the quality of life of its people.

- It provides supporting services in the main areas of industrial and agricultural production, domestic and foreign trade and commerce.

**Types of Infrastructure**

- Economic Infrastructure
  - Transport
  - Communication
  - Power
  - Science & Technology
    - Irrigation and watershed management
    - Financial Institutions
  - Social Infrastructure
    - Education
    - Health
    - Housing
    - Civic Amenities
    - Law & Order etc.
• **Importance of infrastructure**
  
  *Raises productivity*
  *Provides employment*
  *Induces foreign investments*
  *Raises ability of work*
  *Facilitates out-sourcing*
  *Raises economic development*
  *Raises size of the market*

• **The state of infrastructure in India**
  
  ◆ India invests approx. 5 percent of its GDP on infrastructure, which is far below that of China and Indonesia.
  
  ◆ With government, private sector in joint partnership with the public sector is also playing a very important role in the infrastructure development.
  
  ◆ India needs to develop its infrastructure specially in the area of rural energy requirement, water, basic amenities and sanitation.

• **Energy**:
  
  Energy is the lifeline of all production activities. Rapid growth in agriculture and industrial sector is not possible without it.

• **Sources of Energy**
  
  **Commercial sources** are coal, petroleum and electricity.
  
  **Non-commercial sources** of energy are firewood, agricultural waste and dried dung.
Conventional sources of energy include both commercial and noncommercial sources of energy.

Example: national gas, coal, petroleum etc.

Non-conventional sources of energy are renewable resources of energy like biomass, solar energy, wind energy, tidal energy, etc.

- **Power/electricity**: The most visible form of energy, which is often identified with progress in modern civilization is power/electricity.

<table>
<thead>
<tr>
<th>Different Sources of Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal</td>
</tr>
<tr>
<td>70%</td>
</tr>
</tbody>
</table>

- **Some challenges in the power sector**

  Insufficient installed capacity

  Under Utilisation of capacity

  Losses incurred by SEBS

  Uncertain role of private sector

  Public unrest

  Shortage of raw materials

  Transmission and distribution losses.

  Operational inefficiency

- **Measures to meet challenges facing the power sector.**

  Reduce transmission and distribution losses.

  Improve plant load factor

  Promote the use of CFLs & LEDs to save energy

  Encourage private sector participation
Encouragement to Non-conventional sources of Energy.

Bio gas generation programmes.

Encouragement to FDI and privatization in Energy production

- **Health**: Health is not only absence of disease but also the ability to realise one’s potential. It is a yardstick of one’s well being. Health is the holistic process related to the overall growth and development of the nation.

**State of health infrastructure:**

- There has been significant expansion in physical provision of health services and improvements in health indicators since independence, but it is insufficient for rapidly increasing population in India.
- Public health system and facilities are not sufficient for bulk of the population.
- There is a wide gap between rural urban areas and between poor and rich in utilising health care facilities.
- Woman’s health across the country has become a matter of great concern with reports of increasing cases of female foeticide and mortality.
- Regulated private sector health services can improve the situation and at the same time, NGOs and community participation are very important in providing health care facilities and reading health awareness.
- Indian system of medicine (ISDM) AYUSH (Ayurveda, yoga and naturopathy, unani, siddha, homoeopathy needs to be explored.

- **Development of health Services in India:-**
  - (i) Decline in Death Rate
  - (ii) Rise in expectancy of life
(iii) Decline in Infant Mortality Rate  
(iv) Control over Deadly Diseases.

- **Health as an Emerging Challenge:**
  (i) Unequal distribution of health care services.  
  (ii) Increasing privatisation of health services.  
  (iii) Poor sanitation Level  
  (iv) Poor upkeep and maintenance of govt. health centres and poor management.

**INFRASTRUCTURE**

1 Marks Question

1. Which of the following is not a type of commercial energy?
   (i) Coal  
   (ii) Electricity  
   (iii) Natural Gas  
   (iv) Firewood

2. Which of the following is considered as non-conventional energy?
   (i) Biomass  
   (ii) Wind energy  
   (iii) Solar energy  
   (iv) All of these

3. What is the meaning of non-conventional sources of energy?
4. What do you mean by transmission and distribution losses?
5. What are the indicators of health status of a country?
6. Mention one advantage of Infrastructure?
7. What is global burden of disease?
8. What is morbidity?
9. What does plant load factor measure?
(10) What do you mean by Infant Mortality Rate?
(11) What are the three basic sources of generation power?
(12) What do you mean by economic infrastructure?

3 & 4 Marks Questions

(1) Differentiate between commercial and non-commercial sources of energy?
(2) Explain the two categories, into which infrastructure is divided. How are both interdependent?
(3) How do infrastructure facilities boost production?
(4) What do you mean by primary and secondary sources of energy?
(5) How does infrastructure contribute to the economic development of economy?
(6) How can we increase the effectiveness of healthcare programme?
(7) Do you agree with a view that tourism in India is less developed owing to the lack of essential infrastructure? (Multi Disciplinary)
(8) Poverty is the cause as well as the consequence of power health. Do you agree with this statement? (Multi Disciplinary)

6 Marks Questions

(1) How does infrastructure play an important role in the social and economic development of our economy?
(2) What problems are being faced by power sector in India?
(3) What are the measures taken to cope up with challenges facing the health sector?
HOTS

(1) How do you justify the statement that India has made a substantial progress in healthcare?

(2) Healthcare in India suffers from ‘urban-rural and poor-rich divide’ Explain how?

Answer to One mark Question

(1) Firewood

(2) All of these

(3) Non Conventional sources of energy are renewable resources of energy like biomass, solar energy, wind energy, tidal energy etc.

(4) Transmission and distribution losses refer to the losses which occur at the time of transmission and distribution of power because of technical reasons, pilferage or theft.

(5) The health status is normally measured in terms of life expectancy at birth, infant mortality rate, birth rate, death rate, along with incidence of communicable and non-communicable diseases.

(6) Infrastructure increases the productivity of the factors of production.

(7) Global burden of disease (GBD) is an indicator used by experts to measure the number of people dying prematurely due to a particular disease as well as the number of years spent by them in a state of disability owing to the disease.

(8) Morbidity means proneness to fall ill.

(9) Plant load factor measures the operational efficiency of thermal power plants.
(10) Infant mortality rate refers to number of deaths of infants before reaching the age of one per 1000 live births during that year.

(11) Coal, Oil and water are three basic sources of generation of power.

(12) Economic infrastructure directly supports the economic system. It helps the economic system from inside.
UNIT 5
ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Points to Remember

- **Environment** is defined as the total planetary inheritance and the totality of all resources. It includes all the biotic and abiotic elements that influence each other.

- All living elements—the birds, animals and plants, forests, fisheries etc. are **biotic elements**.

- **Abiotic elements** of the environment include non-living elements like air, water, land, rocks and sunlight etc.

- **Functions of the Environment**
  
  (i) Environment supplies resource (both renewable and nonrenewable resources) for production.

  (ii) Environment assimilates waste,

  (iii) Environment sustains life.

  (iv) Environment enhances quality of life.

- The environment is able to perform these functions without any interruption as long as demand on these functions is within its carrying capacity.

- Carrying capacity implies two things:
  
  (i) Resource extraction should remain below the rate of resource regeneration.

  (ii) Generation of wastes should remain within the absorption capacity of the environment.
If these two conditions are not fulfilled, then environmental crisis occurs.

- Absorptive capacity of the environment means the ability of the environment to absorb degradation.

- The various reasons for **environmental crisis** are as under:
  (i) Population explosion and advent of industrial revolution.
  (ii) The intensive and extensive extraction of both renewable and nonrenewable resources.
  (iii) The affluent consumption and production standards of developed countries.

- **Renewable resources** are those which can be used without the possibility of the resource becoming depleted or exhausted. That is, a continuous supply of resource remains available for e.g. tress in forest and the fishes in the oceans.

- Non renewable resources are those which get exhausted with extraction and use. For example fossil fuel.

- Two basic problems related to environment are
  (i) Problem of pollution.
  (ii) Problem of excessive exploitation of natural resources.

- **Pollution** is contamination of useful things such as air, water, land etc. with undesirable or harmful materials like foul gases, smoke, poisonous chemicals, etc.

- The major forms of pollution are as follows
  (i) Air pollution
  (ii) Water Pollution
(iii) Noise Pollution
(iv) Land Pollution

- **Global warming** is a gradual increase in the average temperature of the earth’s lower atmosphere and oceans.

Global warming is caused by man-made increase in carbon dioxide (C02) and other greenhouse gases through the burning of fossil fuels and deforestation.

Some of the long term **results of global warming** are as follows:

(i) Melting of polar ice with a resulting rise in sea level and coastal flooding.

(ii) Extinction of species as ecological niches disappear.

(iii) more frequent tropical storms and

(iv) An increased incidence of tropical diseases.

- **Ozone depletion** refers to reduction in the amount of Ozone (a protective layer) in the stratosphere.

The problem of Ozone depletion is caused by high levels of CFC used as cooling substances in air conditioners and refrigerators.

As a result of depletion of the ozone layer, more ultra violet (UV) radiation comes to earth and causes damage to living organism.

The threat to India’s environment poses a dichotomy-threat of poverty induced environmental degradation and, at the same time, threat of pollution from affluence and rapidly growing industrial sector.

- Air pollution, water contamination, soil erosion, deforestation and wildlife extinction are some of the most pressing environmental concerns of India.

The priority issues identified in India are:
(i) Land degradation
(ii) Biodiversity loss
(iii) Air pollution with special reference to vehicular pollution in urban cities.
(iv) Management of fresh water.
(v) Solid waste management.

- Land degradation refers to a decline in the overall quality of soil, water or vegetation condition, commonly caused by human activities.

- Some of the factors responsible for land degradation are
  (i) loss of vegetation occurring due to deforestation.
  (ii) Forest fires and over grazing.
  (iii) Improper crop rotation.
  (iv) Encroachment into forest lands.
  (v) Shifting cultivation.
  (vi) Indiscriminate use of agro-chemicals such as fertilizers and pesticides.
  (vii) Improper planning and management of irrigation systems.
  (viii) Extraction of ground water in excess of the recharge capacity.
  (ix) Poverty of the agriculture-dependent people.
  (x) Non-adoption of adequate soil conservation measures.

- Chipko and Appiko movements are related to protect forests.

In order to address two major environmental concerns in India, viz, water and air pollution, the government set up the central pollution control board (CPCB) in 1974. Board investigate, collect and disseminate information relating to water, air and pollution, lay down standards of sewage/trade effluent and emissions.
• India’s rapid economic development has made us aware of two realities:
  (i) Economic development has lifted millions out from poverty.
  (ii) Economic development has been accompanied by accelerated depletion of natural resources and rapid deterioration in environment quality.

• **Sustainable development** is that process of development which meets the needs of present generation without reducing the ability of future generation to meet their own needs.

• **Main features of sustainable development** are as under:
  (i) Sustained rise in Real per Capita Income and Economic welfare.
  (ii) Rational use of natural resources.
  (iii) No reduction in the ability of the future generation to fulfill their own needs.
  (iv) No increase in pollution.

• **To achieve sustainable development, the following needs to be done:**
  (i) Limiting the human population.
  (ii) Technological progress should be input efficient and not input consuming.
  (iii) Renewable resources should be extracted on a sustainable basis, that is, the rate of extraction should not exceed rate of regeneration.
  (iv) For non-renewable resources rate of depletion should not exceed the rate of creation of renewable substitutes.
  (v) Inefficiencies arising from pollution should be corrected.

• Strategies for Sustainable Development.
  (i) Use of non-conventional sources of energy.
(ii) Use of cleaner fuels: LPG, Gobargas in rural areas and CNG in Urban areas.
(iii) Use of Solar energy and wind power.
(iv) Shift to organic farming.
(v) Recycle the wastes
(vi) Public means of transport.
(vii) Traditional knowledge and practices.
(viii) Establishment of Mini-Hydel plants.

SUSTAINABLE DEVELOPMENT

One Mark Question

(1) An increase in real income along with an increase in economic welfare is called:
   (i) economic development
   (ii) Sustainable Development
   (iii) economic growth
   (iv) None of these

(2) Which of the following is not considered as an element of environment?
   (i) Land
   (ii) Whether
   (iii) air
   (iv) Electricity

(3) Define environment.

(4) Give two examples of biotic elements of environment.

(5) Give the meaning of renewable resources.

(6) What do you mean by non-renewable resources.

(7) What happens when the rate of resource extraction exceeds that of their regeneration?

(8) What is global warming?
(9) Give two examples of overuse of resources.
(10) Define sustainable development.
(11) Give two examples of misuse of resources.
(12) Mention any one measure to control air pollution.
(13) Give the name of two movements which aimed at protesting forests?

3/4 Marks Questions
(1) What are the functions of the environment?
(2) Identify six factors contributing to land degradation in India?
(3) Outline the steps involved in attaining sustainable development in India?
(4) Define the concept of sustainable development and state its features?
(5) Do you agree with the view that the use of public transport in place of personal transport reduces environmental degradation?

6 Marks Questions
(1) Do you agree with a view that environmental degradation is an avoidable opportunity cost of development? Write your observations as students of economic.
(2) Explain how India’s environmental problems are both poverty induced as well as the consequences of affluence in living standards.
(3) How economic development causes environmental degradation? Explain.

HOTS
(1) Do you think that the development process is really sustainable in India?
(2) How would you explain the concepts of economic growth, economic development and sustainable development?
(3) Is environmental crisis a recent phenomenon? If so, why?
One Marks Answers

(1) economic development
(2) Electricity
(3) Environment is defined as the total planetary inheritance and the totality of all resources.
(4) Animal and plants.
(5) Renewable resources are those which can be used without the possibility of being exhausted, such as trees, fishes etc.
(6) Non-renewable resources refer to those resources which get exhausted with extraction and use such as fossil fuel, Coal etc.
(7) The environment fails to perform its vital function of life sustences and its leads to the situation of environment crisis.
(8) Global Warming is a gradual increases in the average temperature of the earth’s lower atmosphere and ocean.
(9) (1) Excessive exploitation of fossil fuel.
   (2) Excessive tree felling
(10) Sustainable development is that process of development which meets the needs of present generation without reducing the ability of future generation to meet their own needs.
(11) (1) Use of woods as a household fuel.
   (2) Use of rivers to absorb Industrial effluents.
(12) Promotion of cleaner fuel, like use of CNG, LPG
(13) (1) Chipko Movement
   (2) Appiko Movement
UNIT-6
DEVELOPMENT EXPERIENCE
OF INDIA

A COMPARISON WITH NEIGHBOURS :

Points to remember :

- Development Path of India, Pakistan and China.
  (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 had 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, all 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 lands 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 buy 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 prices.

(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 contributes 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.
MODEL TEST PAPER

Economic XI

Time : 3½ hrs.                          M.M. : 80+10

1. What do you mean by economic activity?  1
2. What is Sampling errors?  1
3. Explain the importance of statistics in economics  3
4. Write fair merits of census method of collecting the data  3

Or

Mention three demerits of Sample method of collecting the data

5. State three features of a good table   3
6. Present the following data in a pre-diagram.   3

<table>
<thead>
<tr>
<th>Items</th>
<th>Percentage expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Labour</td>
<td>25</td>
</tr>
<tr>
<td>2. Bricks</td>
<td>15</td>
</tr>
<tr>
<td>3. Cement</td>
<td>20</td>
</tr>
<tr>
<td>4. Steel</td>
<td>15</td>
</tr>
<tr>
<td>5. Timber</td>
<td>10</td>
</tr>
<tr>
<td>6. Supervision</td>
<td>15</td>
</tr>
</tbody>
</table>

7. Find the median of the following data  3

<table>
<thead>
<tr>
<th>X</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>

Ans : 35
8. Calculate the mean marks obtained by the students from the following date

<table>
<thead>
<tr>
<th>Marks</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Student</td>
<td>4</td>
<td>6</td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>

Mean 30.2

Or

Write merit and demerit of mean.

9. Calculate the following
   (i) Range & Coefficient of Range
   (ii) Mean deviation from median

<table>
<thead>
<tr>
<th>X</th>
<th>0-5</th>
<th>5-10</th>
<th>10-15</th>
<th>15-20</th>
<th>20-25</th>
<th>25-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>7</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

**Ans.** R = 30

Or

C of R = 1

Mdm = 6.33

Calculate standard deviation from the following services.

<table>
<thead>
<tr>
<th>Class</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
<th>60-70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

SD = 15.81

10. Stare the steps involved in drawing a lorenz curve
11. Following are the marks in maths and statistics of 10 students of a class

<table>
<thead>
<tr>
<th>Marks in Maths</th>
<th>60</th>
<th>64</th>
<th>68</th>
<th>62</th>
<th>67</th>
<th>69</th>
<th>70</th>
<th>72</th>
<th>65</th>
<th>61</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marks in Statistics</td>
<td>50</td>
<td>48</td>
<td>56</td>
<td>65</td>
<td>49</td>
<td>52</td>
<td>57</td>
<td>60</td>
<td>59</td>
<td>47</td>
</tr>
</tbody>
</table>

Calculate the Spearman’s coefficient of rank correlation.

Ans = 0.29

12. For the data given in following table calculate index no by (i) Laspeyre’s Method (ii) Paaschi’s Method (iii) Fisher’s ideal method

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Base year</th>
<th>Current year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price (Rs)</td>
<td>Quantity</td>
</tr>
<tr>
<td>A</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>C</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>10</td>
</tr>
</tbody>
</table>

Ans: (i) 118.96, (ii) 119.79, (iii) 119.37

Or

Explain the characteristics of classification?

SECTION-B

13. The first official census in India occurred in which year

14. Define workforce

15. Explain two fold motive of systematically de-industrialisation policy of colonial Govt.
16. Explain Positive effects of Introduction of Railways by colonial govt. in India 3

Or

Explain the role of small scale industries in the social economic development of our country 3

17. Define Privatisation : State the measures adopted for Privatisation 3

18. Differentiate between stablisation measures and structural adjustment under New Economic Policy 3

19. Describe the concept of sustainable development and state its features ? 4

Or

What is meant by poverty ? Distinguish between absolute and relative poverty 4

20. What do you understand by the term rural development ? What are the key issues of rural development 4

21. State the meaning of liberalisation and failures of economic planning in India. 6

22. State the meaning of liberalisation and explain the measures adopted for liberalisation. 6

23. Human Capital and Economic growth re-inforce each other. Elaborate this statement 6

Or

What do you mean by unemployment ? what are the various types of rural unemployment ? what are the adverse effects of unemployment ?
MARKING SCHEME

1. Activity related to livelihood and credits flow of goods and services
2. Difference between result of censes and sample.
3. (1) Useful in planning
   (2) Useful in comparison
   (3) Useful in prediction
4. (i) Reliable
   (ii) Less Biased
   (iii) Wide Coverage
   (iv) Multiple uses
   Or
   (i) Biased
   (ii) Wrong conclusion
   (iii) Special training
   (iv) Time and money consuming.
5. (i) Appropriate heading
   (ii) Comparative analysis
   (iii) Ideal size
6. % expenditure 25 15 20 15 10 15
   Expenditure in Degrees 90 54 72 54 36 54
   Draw proper diagram.
7. \( Md = \frac{N}{2} \) th item = 12.5th item
Md = L + \( \frac{N/2 - Cf}{f} \times i \)

Ans : 35.

8. \( \bar{X} = \frac{\sum fm}{\sum f} = \frac{1510}{50} = 30.20 \)

Or

Merits of Mean
(i) Simple (ii) Certain (iii) Capable of algebraic treatment (iv) fixed

Demerits of Mean
(i) Impact of extreme value
(ii) Not representative in all cases
(iii) Inappropriate
(iv) Improper conclusion

9. (i) Range = H-L

= 30-0 = 30

Coefficient of Range = \( \frac{H-L}{H+L} = \frac{30-0}{30+10} = \frac{30}{40} = 0.75 \)

(ii) \( Md = \frac{N}{2} \)th item = 30/2 = 15th item

\[ \text{Md} = L + \frac{N/2 - Cf}{f} \times i \]

\[ = 10 + \frac{15-11}{8} \times 5 \]

\[ = 12.5 \]

\[ \text{MDn} = \frac{\sum f |D|}{\sum f} = \frac{190}{30} = 6.33 \]
Or

\[ \text{S.D.} = \sqrt{\frac{\sum fd^2}{N} - \left( \frac{\sum fd}{N} \right)^2} \]

\[ = \sqrt{\frac{8000}{30} - 0} \]

\[ = \sqrt{266.67} = 16.33 \]

10. (i) Convert into cumulative value
(ii) Find Cumulative percentage
(iii) Frequency on x-axis and values on y-axis
(iv) Draw line of equal distribution
(v) Express loren curve and compare with line of equal distribution

11. \[ \gamma = 1 - \frac{6 \sum D^2}{N^3} \]

Ans = 0.29

12. Laspayere method \[ = \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100 = 118.96 \]
Pasche Method \[ = \frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100 = 119.79 \]
Fischer \[ = \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \times \frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100} = 119.37 \]

Or
(1) Comprehensive  (2) Clarity  (3) Homogeneity
(4) Appropriate  (5) Stability  (6) Elastic
ANSWER KEY SECTION-B

Ans

13. 1881

14. The number of Persons, who are actually employed at a Particular time

15. (i) To get raw materials from India;
    (ii) To sell finished Products of British Industries.

16. (i) For effective administration control;
    (ii) Promots national Integration;
    (iii) Commercialization of Indian agriculture

    or

    (i) Generate employment
    (ii) Locational flexibility
    (iii) Requires less capital

17. Privatisation is the general process of involving the private sector in the ownership or operation of a state owned enterprises measures :
    (i) Contractions of public sector
    (ii) Abolish the ownership of Govt. in the management of Public enterprises
    (iii) Sale of shares of Public enterprises

18. Stabilisation measures are short run measures to control rise in prices, adverse balance of Payment and Fall in foreign exchange reserve where as structural adjustment are long run policies to abolish controls, eliminate redtapism and make the decision making process more efficient.
19. A Process of development which meets the needs of present generation without reducing the ability of future generations to meet their own needs.

(i) Rational use of natural resources;
(ii) Sustained rise in Real per capital income
(iii) No increase in pollution.

OR

Inability to fulfill the minimum requirement of life like, food, clothing, housing, education & health facilities etc.

Absolute poverty refers to total number of people living below the poverty time. Relative poverty refers to poverty of people in comparison to other people, region or mentions.

20. Rural development is an action plan for the economic and social development of rural areas.

Issues in rural development

(i) A robust system of rural credit;
(ii) Diversification of crops;
(iii) A proper marketing system

21. **Achievements:**

(i) Diversified industrial base
(ii) Increase in national Income & per capital Income
(iii) Self Reliance in food production
(iv) Abolition of intermediatry

**Failures:**

(i) Jobless growth;
(ii) Stagnant occupational Structure;
(iii) Poor performance of public sector
(iv) Increase in regional inequalities

22. Removing all unnecessary control and restrictions like permit licenses, quotas etc. measures;
   (i) Industrial sector reform
   (ii) Financial sector reform
   (iii) Fiscal reforms
   (iv) Foreign exchange reforms
   (v) Trade and Investment reforms.

23. (i) Rise in human capital raises economic growth as modern attitude, better quality of life leads to more efficiency, more production & increase in economic growth.
   (ii) Rise in economic growth raises human capital as rise in per capital income means more investment in education & health which leads to increase in human capital.

   OR

Unemployment is a situation where a person is ready & willing to work at the prevailing wage rate but does not get work. Seasonal unemployment & Disguised unemployment is found in Rural areas.

Adverse effects of unemployment
   (i) Rise in Poverty
   (ii) Social unrest
   (iii) Loss of Human Resources.
Important Notes to Remember

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