

**SAMPLE CONTENT**

**Perfect**

# Psychology

**STD. XII ARTS**

As per the new textbook prescribed  
by Maharashtra State Board

Psychology is a social science  
that studies human behaviour  
and abstract mental processes.



**Mrs. Meghana Jadhav**  
M.A., M.Ed., SET (Edu., Geog.)

**Target** Publications® Pvt. Ltd.

# PERFECT Psychology

Std. XII Arts

## Salient Features

- Based on the Latest Textbook
- Exhaustive content coverage in Question and Answer format
- Wide variety of questions in each chapter
- Includes relevant Board Questions of March 2020
- Includes solved questions from the Board Question Paper of March 2022
- 'Chapter overview' to enable quick revision of key points
- 'Glossary' for explaining meaning of difficult terms
- 'Important psychologists and their contribution' section for quick recap
- 'Gyan Guru' (GG) offers a practical touch to theory
- 'For your understanding' for better conceptual clarity
- 'QR codes' to refer relevant content
- Coverage of the 'Activities' section
- Assessment and answer key at the end of every chapter for self-evaluation
- Include Model paper (Answer key is provided through QR Code)
- Included Board Question Paper of March 2023 (Solution in pdf format through QR code)

Printed at: **Print to Print**, Mumbai

© Target Publications Pvt. Ltd.

No part of this book may be reproduced or transmitted in any form or by any means, C.D. ROM/Audio Video Cassettes or electronic, mechanical including photocopying; recording or by any information storage and retrieval system without permission in writing from the Publisher.

## PREFACE

**Perfect Psychology: Std. XII** aims to prepare students for their Board Examination. It not only provides answers to all textual questions but also addresses extra questions in every chapter to make students ready to face the competitive pressure.

While creating this book, we have attempted to seek a balance between the objectives of ‘obtaining good marks’ and ‘acquiring knowledge.’ ‘Chapter Overview’ and ‘Important psychologists and their contribution’ section is provided in each chapter to enable quick revision of key points. It is followed by ‘Glossary’ that explains the meaning of difficult terms. We have answered all ‘self-response’ type questions in a way that it will encourage students to bring a qualitative change in their personal lives. We have also incorporated sections such as Gyan Guru, For your understanding and QR codes in this book to realise our twin-objective.

At the end of every chapter, we've included Chapter Assessment with Answer Key. It stands as a testimony to the fact that the student has understood the chapter thoroughly. We have also provided model question paper based on the latest paper pattern and Board Question Paper of March 2023. Solutions of Model Paper and Board Question Paper of March 2023 are provided through Q. R. Code.

We are sure that students and teachers alike would love our unique presentation of content and find it purposeful.

- Publisher

**Edition:** Second

The journey to create a complete book is strewn with triumphs, failures and near misses. If you think we've nearly missed something or want to applaud us for our triumphs, we'd love to hear from you.

Please write to us at: [mail@targetpublications.org](mailto:mail@targetpublications.org)

### Disclaimer

This reference book is transformative work based on textbook ‘Psychology’; First Reprint: 2021 published by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. We, the publishers are making this reference book which constitutes as fair use of textual contents which are transformed by adding and elaborating, with a view to simplify the same to enable the students to understand, memorize and reproduce the same in examinations.

This work is purely inspired upon the course work as prescribed by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. Every care has been taken in the publication of this reference book by the Authors while creating the contents. The Authors and the Publishers shall not be responsible for any loss or damages caused to any person on account of errors or omissions which might have crept in or disagreement of any third party on the point of view expressed in the reference book.

© reserved with the Publisher for all the contents created by our Authors.

No copyright is claimed in the textual contents which are presented as part of fair dealing with a view to provide best supplementary study material for the benefit of students.

## KEY FEATURES

After reading a chapter from textbook, students may want to revise all key points quickly before attempting questions based on the chapter. 'Chapter overview' gives a bird's eye-view of the entire chapter.

### Chapter Overview

### Glossary

Glossary provides the meaning of difficult terms from the chapter.

This section provides a brief summary of all important psychologists mentioned in the chapter and their work.

### Important psychologists and their contribution

### GG – Gyan Guru

Gyan Guru, our very own mascot, keeps popping up throughout the book. He offers real-life example or an interesting fact associated with the topic.

Certain concepts are tricky and difficult to understand. In such cases, 'For your understanding' offers better conceptual clarity through additional explanation.

### For Your Understanding

### QR Codes

- QR codes given throughout the book enable students to access relevant content for the given topic.
- Solution of Model Paper and Board Question Paper of March 2023 are provided through Q. R. Code.

Chapter assessment at the end of every chapter enables students to evaluate themselves. This evaluation becomes more effective with the help of the answer key.

### Chapter Assessment

### Question Paper

Model Question Paper and Board Question Paper of March 2023 are provided for the students to know about the types of questions that are asked in the Board Examinations.

## PAPER PATTERN

Q. No.	Questions	Marks per question	No. of questions to attempt	Marks without option	Marks with options
Q.1.	(A) Complete the following statements by selecting the appropriate words given in the brackets.	1	5	5	5
	(B) Match the pairs.	1	5	5	5
	(C) Write whether the following statements are 'True' or 'False'.	1	5	5	5
	(D) Answer the following questions in one sentence each.	1	5	5	5
Q.2.	Answer the following questions in 25 to 30 words each.	2	Any (5) out of (7)	10	14
Q.3.	Write short notes on the following topics in 50 to 60 words each.	3	Any (4) out of (6)	12	18
Q.4.	Write answers to the following questions based on examples.	2	Any (4) out of (6)	8	12
Q.5.	Explain the following concepts in 25 to 30 words each.	2	Any (5) out of (7)	10	14
Q.6.	Answer the following questions in 80 to 100 words each with the help of the given points.	5	Any (2) out of (3)	10	15
Q.7.	Answer the following questions in 150 to 200 words each.	10	Any (1) out of (2)	10	20
<b>Total Marks</b>				<b>80</b>	<b>113</b>

## CONTENTS

No.	Topic Name	Marks without option	Marks with options	Page No.
1.	Psychology: A Scientific Discipline	10	14	1
2.	Intelligence	12	17	17
3.	Personality	12	17	31
4.	Cognitive Processes	10	14	45
5.	Emotions	10	14	60
6.	Psychological Disorders	10	14	78
7.	First Aid in Mental Health	8	11	94
8.	Positive Psychology	8	12	106
<b>Total Marks</b>		<b>80</b>	<b>113</b>	
•	Model Question paper	-	-	121
•	Board Question Paper March 2023 (Solution in pdf format through QR code)			123

- Note:**
- All textual questions are represented by \* mark.
  - All questions based on intext content are represented by # mark.
  - <sup>g</sup> symbol after a word in theory indicates that the meaning of the word is provided in the glossary.

## Chapter Overview

<b>Introduction</b>	<ol style="list-style-type: none"> <li>1. Today, almost every sphere of our life is influenced by sciences.</li> <li>2. The word science is derived from the Latin word 'Scientia' meaning knowledge.</li> <li>3. Sciences are broadly classified into physical, biological and social sciences.</li> <li>4. Psychology is one of the social sciences.</li> </ol>
<b>Key features of science</b>	<ol style="list-style-type: none"> <li>1. <b>Empirical evidence:</b> Empirical evidence refers to acquiring information through observation or experiments. Scientific knowledge is based on verifiable empirical evidence.</li> <li>2. <b>Objectivity:</b> Objectivity refers to the ability to see the facts as they are and not as the investigator might wish them to be. Science objectively studies any phenomenon.</li> <li>3. <b>Scientific causality:</b> Science aims at finding out the cause and effect relationship between variables under consideration.</li> <li>4. <b>Systematic exploration:</b> Science systematically explores a phenomenon by adopting certain sequential procedures.</li> <li>5. <b>Replication:</b> Replication means the ability to reproduce knowledge under the same stated circumstances, anywhere and anytime. Scientific studies are replicable.</li> <li>6. <b>Predictability:</b> Scientists attempt to make and explain predictions based on their study.</li> </ol>
<b>History of Psychology as a science</b>	<ol style="list-style-type: none"> <li>1. <b>Beginning as a branch of Philosophy:</b> Psychology was a branch of philosophy until 1870s.</li> <li>2. <b>Emergence as a separate discipline:</b> Psychology emerged as a separate scientific discipline when Wilhelm Wundt established the world's first psychology laboratory in 1879 in Germany.</li> <li>3. <b>Emergence of structuralism:</b> Structuralism is regarded as the first school of thought in Psychology. It was advocated by Wilhelm Wundt and Edward B. Titchener.</li> <li>4. <b>Emergence of Functionalism:</b> Functionalism was advocated by William James. He focused on the study of human consciousness.</li> <li>5. <b>Emergence of Psychoanalysis:</b> Sigmund Freud proposed a theory of Psychoanalysis in early 1890s. He focused on the study of the unconscious mind.</li> <li>6. <b>Emergence of Behaviourism:</b> During the early 20<sup>th</sup> century, John B. Watson advocated Behaviourism. He focused on the study of observable human behaviour.</li> <li>7. <b>Emergence of Humanistic Psychology:</b> During the second half of the 20<sup>th</sup> century, Carl Rogers advocated Humanistic Psychology. He studied the power of free will, self-determination and self-actualisation.</li> <li>8. <b>Emergence of Cognitivism:</b> During the 1950s and 1960s, Psychoanalysis and Behaviourism were replaced by the Cognitivism. Ulric Neisser is generally considered as the founder of Cognitivism.</li> </ol>
<b>Research methods in Psychology</b>	<ol style="list-style-type: none"> <li>1. There are many scientific methods to study behaviour.</li> <li>2. <b>Experimental method:</b> In experimental method, an experimenter conducts experiments on the participants by following a certain procedure.</li> <li>3. <b>Survey method:</b> Survey method is used for collecting data from a sample with the help of questionnaires, checklists, rating scales, inventories and interviews.</li> <li>4. <b>Observation method:</b> It is a method in which human behaviour is observed in a natural or laboratory setting. This method is very useful when experiments cannot be conducted.</li> <li>5. <b>Case study method:</b> Case study refers to an in-depth look at an individual, group or a particular event. In case study method, a researcher collects information from multiple sources such as family, friends and colleagues of an individual.</li> <li>6. <b>Correlation studies:</b> Correlational studies make use of correlation as a statistical tool to understand the relation among variables.</li> </ol>





<b>Challenges in establishing Psychology as a science</b>	<ol style="list-style-type: none"> <li><b>1. Psychology in pre-paradigmatic state:</b> Thomas Kuhn asserts that the science of Psychology is still in a pre-paradigmatic state. It means Psychology has not yet succeeded in producing a cumulative body of knowledge having a clear conceptual core.</li> <li><b>2. Issues related to objectivity and validity:</b> The criterion of objectivity states that research should not be influenced by any person specific factors while the validity ensures that the findings hold true (valid) even when research is repeated. Psychology falls short on these criteria as it is based on the use of certain subjective methods.</li> <li><b>3. Issues related to predictability and replicability:</b> It is difficult to make exact predictions regarding human behaviour as people respond differently in different situations. So, the test results are more varied, harder to control and difficult to replicate.</li> <li><b>4. Objectifying humans:</b> Some existential and humanistic psychologists criticise that Psychology treats human beings as things or as objects by subjecting them to experiments.</li> </ol>
<b>Rationality</b>	<ol style="list-style-type: none"> <li>1. Stanovich and his colleagues stated that rationality involves adaptive reasoning, good judgement and good decision making.</li> <li>2. According to Dr. Albert Ellis, rationality helps a person to attain goals and to be happy.</li> <li>3. Rational people have an understanding of their own self-interest as well as social interest. They are self-directed and flexible. They take complete responsibility of their own growth and accept themselves with all their flaws and strengths.</li> </ol>

### Glossary

<b>Correlation coefficient</b>	Number which represents the extent of interdependence between two variables
<b>Dependent variable</b>	Variable that is being measured or tested in an experiment
<b>Independent variable</b>	Variable which is controlled and does not depend on other variables
<b>Interview</b>	Face to face meeting between people, especially for consultation
<b>Participant</b>	A person who takes part in something
<b>Pre-paradigmatic state</b>	State in which there is no single pattern which defines the discipline and governs its practices
<b>Replicability</b>	Ability of a scientific experiment to be repeated so as to obtain consistent results

### Important psychologists and their contribution

<b>Dr. Albert Ellis</b>	Pioneered the development of Rational Emotive Behavioural Therapy
<b>Edward B. Titchener</b>	Important role in establishing psychological school of thought called structuralism
<b>John B. Watson</b>	Pioneering psychologist in developing behaviourism
<b>Sigmund Freud</b>	Considered as founder of Psychoanalysis
<b>Ulric Neisser</b>	Known as the father of Cognitive Psychology
<b>Wilhelm Wundt</b>	Established the world's first psychology laboratory
<b>William James</b>	Considered as the father of American Psychology



**Q.1. [A] Choose the correct option and complete the following statements. [1 Mark each]**

1. We live in an age of \_\_\_\_\_.  
(A) science (B) psychology  
(C) primitive technology
- \*2. Psychology is a \_\_\_\_\_ science.  
(A) natural (B) social  
(C) biological
3. \_\_\_\_\_ assures the reliability of scientific results.  
(A) Predictability (B) Replication  
(C) Objectivity
4. The origin of Psychology dates back to the \_\_\_\_\_ Greeks.  
(A) ancient (B) medieval  
(C) modern
- \*5. Till 1879, Psychology was a branch of \_\_\_\_\_.  
(A) physics (B) philosophy  
(C) physiology
6. \_\_\_\_\_ is widely regarded as the first school of thought in Psychology.  
(A) Functionalism (B) Behaviourism  
(C) Structuralism
- \*7. \_\_\_\_\_ is considered as founder of Psychoanalysis.  
(A) Wilhelm Wundt (B) Carl Rogers  
(C) Sigmund Freud
8. During the 1950s and 1960s, Psychoanalysis and Behaviourism were replaced by \_\_\_\_\_.  
(A) Cognitivism (B) Structuralism  
(C) Functionalism
9. The findings of experimental method are \_\_\_\_\_.  
(A) verifiable (B) subjective  
(C) unpredictable
10. Case study is one of the \_\_\_\_\_ research methods used in Psychology.  
(A) quantitative (B) qualitative  
(C) primitive
11. Sigmund Freud and Jean Piaget were the two important figures to use \_\_\_\_\_ method widely.  
(A) survey (B) correlation  
(C) case study
12. The \_\_\_\_\_ of a correlation coefficient<sup>ⓐ</sup> indicates the direction of the relationship between the variables.  
(A) sign (B) value  
(C) magnitude
13. The hours of study and marks in exam usually have \_\_\_\_\_ correlation.  
(A) positive (B) negative  
(C) zero
14. \_\_\_\_\_ believes that Psychology is still in a pre-paradigmatic state<sup>ⓐ</sup>.  
(A) Thomas Kuhn (B) Carl Rogers  
(C) Ulric Neisser
15. A major goal of psychology is to \_\_\_\_\_ behaviour.  
(A) predict (B) regulate  
(C) observe
16. Psychology accepts the fact that \_\_\_\_\_ is dynamic and complex.  
(A) human behaviour (B) world  
(C) science
17. Rational Emotive Behavioural Therapy is a popular method of intervention in the field of \_\_\_\_\_ Psychology.  
(A) Counselling (B) Clinical  
(C) Social
18. Rational people are \_\_\_\_\_.  
(A) flexible (B) intolerant  
(C) unhappy

**Answers:**

- |                  |                     |
|------------------|---------------------|
| 1. science       | 2. social           |
| 3. Replication   | 4. ancient          |
| 5. philosophy    | 6. Structuralism    |
| 7. Sigmund Freud | 8. Cognitivism      |
| 9. verifiable    | 10. qualitative     |
| 11. case study   | 12. sign            |
| 13. positive     | 14. Thomas Kuhn     |
| 15. predict      | 16. human behaviour |
| 17. Counselling  | 18. flexible        |

**Q.1. [B] Match the pairs. [1 Mark each]**

\*1.

Group 'A'		Group 'B'	
i.	Structuralism	a.	John Watson
ii.	Functionalism	b.	Carl Rogers
iii.	Behaviourism	c.	Ulric Neisser
iv.	Cognitivism	d.	William James
		e.	Wilhelm Wundt





2.

Group 'A'		Group 'B'	
i.	Scientia	a.	Effect
ii.	Independent variable <sup>®</sup>	b.	Behaviourism
iii.	Determinism	c.	Knowledge
iv.	Experimental method	d.	Cause
		e.	Controlled conditions

**Answers:**

1. i – e, ii – d, iii – a, iv – c
2. i – c, ii – d, iii – b, iv – e

**Q.1. [C] State whether the following statements are true or false. [1 Mark each]**

- \*1. Psychology is a study of mental processes.
2. Sciences are broadly classified into two basic groups.
3. Science is an evidence-based approach to study and interpret information.
4. Psychology did not emerge directly as a science.
5. Edward B. Titchener gave importance to the study of the unconscious mind.
6. The first half of the 20<sup>th</sup> century was dominated by Psychoanalysis and Behaviourism.
- \*7. An experimenter is a person on whom the experiment is conducted.
8. Developing hypothesis is a first step in experimental method.
9. Survey method is largely used by social psychologists, educational psychologists and industrial psychologists.
- \*10. Case study method is quite often used by clinical psychologists.
- #11. The case of 'Anna O' played a remarkable role in the establishment and development of psychoanalysis.
12. A correlation coefficient is always a number between 0 to +1.
13. Introspection method is inherently objective in nature.
14. The test results in Psychology are varied, harder to control and difficult to replicate.
15. Being a science, Psychology tries to establish laws that govern human behaviour.
16. Dr. Albert Ellis proposed Rational Emotive Behavioural Therapy.
17. Rational people tend to be biased in their thoughts and actions.

**Answers:**

- |         |          |         |
|---------|----------|---------|
| 1. True | 2. False | 3. True |
| 4. True | 5. False | 6. True |

- |           |           |           |
|-----------|-----------|-----------|
| 7. False  | 8. False  | 9. True   |
| 10. True  | 11. True  | 12. False |
| 13. False | 14. True  | 15. True  |
| 16. True  | 17. False |           |

**Q.1. [D] Find odd one out.**

1. Replication, Predictability, Subjectivity, Empirical evidence
2. Functionalism, Empiricism, Psychoanalysis, Behaviourism
3. Questionnaires, Checklists, Case study, Rating scales

**Answers:**

- |                  |               |
|------------------|---------------|
| 1. Subjectivity  | 2. Empiricism |
| 3. Rating scales |               |

**Q.1. [E] Answer the following in one sentence each. [1 Mark each]**

- 1. What is the origin of word science?**  
**Ans:** The word science is derived from the Latin word 'Scientia' which means knowledge.
- 2. What is objectivity?**  
**Ans:** Objectivity means the ability to see and accept facts as they are and not as the investigator might wish them to be.
- \***3. In which year was the first psychology laboratory established?**  
**Ans:** The first psychology laboratory was established in 1879.
- \***4. Who is considered as the 'Father of American Psychology'?**  
**Ans:** William James is considered as the 'Father of American Psychology'.
- 5. Which method assigned the status of science to Psychology?**  
**Ans:** Experimental method has assigned the status of science to Psychology.
- \***6. What is meant by an experimenter?**  
**Ans:** An experimenter is a person who conducts an experiment.
- #**7. Why it is not possible to study certain aspects of behaviour using experimental method?**  
**Ans:** It is not possible to study certain aspects of human behaviour using experimental method due to ethical constraints and the risk factors involved.
- 8. Which type of psychologists mostly use observation method?**  
**Ans:** Observation method is widely used by child psychologists, clinical psychologist and social psychologists.



9. **What is indicated by a sign of correlation coefficient?**

**Ans:** The sign (+ or -) of a correlation coefficient indicates the direction of the relationship between the variables.

10. **When is science appreciated by the society?**

**Ans:** Science is appreciated by society when the application of scientific knowledge improves the quality of life.

11. **Who gave the values of rational living?**

**Ans:** Dr. Albert Ellis gave the values of rational living.

12. **What is said to be the slogan of Rational Emotive Behavioural Therapy?**

**Ans:** 'Safeguard your self-interest and know other's interest' is the slogan of Rational Emotive Behavioural Therapy.

**Q.2. Write answers to the following questions based on examples. [2 Marks each]**

1. **Rajesh is conducting an experiment on economic behaviour of human beings. While doing so, he keeps his personal biases, beliefs, wishes and values aside. Which feature of science is described in this example?**

**Ans:** Objectivity

2. **A psychological experiment conducted in the United States in 2010 was reproduced by Sagar in India in 2010 to assure the reliability of its results. This is a description of which key feature of science?**

**Ans:** Replication

3. **Based on psychological theories, it is possible to speculate when a person may show aggressive behaviour. This is a description of which key feature of science?**

**Ans:** Predictability

4. **Shailesh collected information from the sample and studied the problems of the workers. Thus, what method of study in Psychology must he have adopted?**

**Ans:** Survey

5. **The experiment conducted by Chetan showed him that increasing the amount of practice reduces the number of errors in writing. What kind of correlation did Chetan find between practice and errors in writing?**

**Ans:** Negative correlation

6. **Higher the income, higher is the standard of living and vice versa. What kind of correlation does this example indicate?**

**Ans:** Positive correlation

**Q.3. [A] Define the following concepts.**

1. **Science**

**Ans:** Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidences.

\*2. **Replicability**

**Ans:** Replicability is the possibility to repeat a research or its findings in order to test its validity.

3. **Correlation**

**Ans:** Correlation is a statistical tool used to measure the relationship between two or more variables. If the change in one variable appears to be accompanied by a change in the other variable, the two variables are said to be correlated and this interdependence is called correlation.

\*4. **Correlation coefficient**

**Ans:** In correlation studies, the extent of correlation between two variables is measured by the correlation coefficient.

5. **Practical Intelligence**

**Ans:** Sternberg and his colleagues suggested that Practical Intelligence can be defined as 'The ability to perform successfully in naturalistic settings in a way that is consistent with one's goal'.

6. **Tolerance**

**Ans:** Tolerance is the willingness to accept behaviour and beliefs of others that are different from one's own. It is one of the characteristics of rational people.

**Q.3. [B] Answer in 25-30 words.**

**[2 Marks each]**

1. **What led to the development of various sciences?**

**Ans:** Since the evolution of Homo Sapiens as a species, the survival instinct of humankind has led humans to explore the world around them. This exploration gradually led to the development of various sciences.

2. **What are correlational studies?**

**Ans:** There are certain scientific studies which make use of correlation as a statistical tool to understand the relation among variables. Such studies are called correlational studies.



**Q.3. [C] Compare and Contrast.**

**1. Humanistic Psychology and Psychoanalysis**

**Ans:**

- i. Humanistic psychology focuses on the study of power of free will, self-determination and self-actualisation. On the other hand, Psychoanalysis emphasises the study of the unconscious mind.
- ii. Humanistic Psychology was advocated by an American psychologist Carl Rogers during the second half of the 20<sup>th</sup> century while a theory of Psychoanalysis was proposed by an Austrian physician Sigmund Freud in early 1890s.



**GG - Gyan Guru**

Sigmund Freud stated that early childhood experiences and unconscious impulses contribute in the development of adult personality and behaviour.

**2. Positive correlation and Negative correlation**

**Ans:**

- i. In case of positive correlation, both variables either increase or decrease at the same time. Conversely, in case of negative correlation, an increase in one variable is associated with a decrease in the other and vice versa.

Type	Variable 'X'	Variable 'Y'
Positive correlation	↑	↑
	↓	↓
Negative correlation	↑	↓
	↓	↑

- ii. The value of correlation coefficient in case of positive correlation is between 0.00 and +1.00 while in case of negative correlation it is between 0.00 to -1.00.

**Q.4. Answer the following questions briefly.**

**1. Explain classification of science.**

**Ans:** Sciences are broadly classified into three basic groups:

- i. Physical sciences (e.g. physics, chemistry, geology)
- ii. Biological sciences (e.g. zoology, botany, physiology)
- iii. Social sciences (e.g. psychology, sociology, economics)

**2. How did Psychology emerge as a separate discipline?**

**Ans:**

- i. Psychology was a branch of philosophy until the 1870s.

- ii. In 1879, a German psychologist Wilhelm Wundt established the world's first psychology laboratory in Germany at the University of Leipzig.
- iii. This event officially marked the inclusion of Psychology as a separate scientific discipline.



**GG - Gyan Guru**

Wilhelm Wundt also introduced the term 'conscious experience'. This term refers to the awareness of the mental activities of an organism.

**Q.5. [A] Write short notes on the following. [3 Marks each]**

**\*1. Survey method**

**Ans:**

- i. A survey is defined as a research method used for collecting data from a pre-defined group of respondents (sample) so as to gain information and insights on various topics of interest such as political opinions, consumers' preferences, etc.
- ii. Survey method collects the required information with the help of questionnaires, checklists, rating scales, inventories and interviews<sup>Ⓞ</sup>.
- iii. Surveys can be undertaken using email, telephonic calls or direct interaction with respondents.
- iv. Survey method is an economic and an efficient method of data collection.
- v. It is largely used by social psychologists, educational psychologists and industrial psychologists.

**\*2. Observation method**

**Ans:**

- i. Observation method is a type of research method. It is very useful when experiments cannot be conducted.
- ii. It is widely used by child psychologists, clinical psychologist and social psychologists.
- iii. In observation method, behaviour is observed in a natural or laboratory setting.
- iv. Observation carried out in a natural setting is called natural observation while observation carried out in a laboratory setting is called controlled observation.
- v. Observation method can be treated as a scientific method. It is beneficial when it is used for a specific purpose of research and is planned in a systematic way.



**\*3. Case study method**

**Ans:**

- i. Case study refers to an in-depth look at an individual, group or a particular event.
- ii. In case study method, a researcher collects information about a particular individual (i.e. case) from multiple sources such as parents, family members, peers, teachers, colleagues, etc. It enables the researcher to assess the individual's current level of psychological functioning.
- iii. While using case study method, a researcher may use several techniques like observation, interview and psychological tests to collect information.
- iv. Case study can be treated as a scientific method as it provides rich descriptive information which often suggests hypotheses for further studies.
- v. It is one of the qualitative research methods mostly used by clinical psychologists.
- vi. Sigmund Freud and Jean Piaget were the two important figures to use case study method widely.

**\*4. Importance of rationality**

**Ans:**

- i. Stanovich and his colleagues stated that rationality involves adaptive reasoning, good judgement and good decision making.
- ii. According to Dr. Albert Ellis, rationality as a personal philosophy helps an individual to attain many goals in life and to be happy.
- iii. Rationality also ensures that a person does not compromise on social norms, values and ethics for the sake of his own happiness.
- iv. A rational person's emotions, thoughts and acts do not get driven by irrational influences.
- v. In short, rationality contributes to psychological well-being of a person and thereby, improves the quality of life.

**Q.5. [B] Answer the following in 50-60 words.**

**1. 'Psychology falls short on the criteria of objectivity and validity.' Explain the statement.**

**Ans:**

- i. Some areas of Psychology such as personality, emotions and attitudes rely on soft research methods like surveys and questionnaires.
- ii. Further, methods such as introspection and psychoanalysis are inherently subjective.

- iii. Due to the use of these methods, it is not possible to reach objective findings which will be valid under the same circumstances in future or at a different place.
- iv. Therefore, Psychology falls short on the criteria of objectivity and validity.

**For your understanding**

- 1. Soft research methods are subjective in nature, i.e. the interpretation of collected data in these methods is largely influenced by social, economic, cultural context as well as knowledge, experience and opinions of researcher.
- 2. The criterion of objectivity states that the research should not be influenced by any person specific factors.
- 3. The criterion of validity refers to the quality of being factual. It ensures that the findings of research hold true (valid) even when research is repeated in future or conducted at a different place.

**2. Explain the concept of 'BE RATIONAL' given by Dr. Albert Ellis.**

**Ans:** According to Dr. Albert Ellis, rationality helps an individual to attain many goals in life and to be happy. To be happy, a person must BE RATIONAL. This concept is explained with the help of the following table:

<b>B</b> (Balance)	Balance between self-interest and interest of others
<b>E</b> (Estimate)	Estimate the time, efforts, gains and losses
<b>R</b> (Respect)	Respect oneself and others
<b>A</b> (Affiliate)	Affiliate with others
<b>T</b> (Tolerate)	Tolerate oneself and others
<b>I</b> (Integrate)	Integrate personal wellbeing with social wellbeing
<b>O</b> (Optimize)	Optimize potential fully
<b>N</b> (Navigate)	Navigate path of success
<b>A</b> (Accept)	Accept the limitations and overcome them
<b>L</b> (Live)	Live life fully

**[Note:**

Scan the QR code to watch Albert Ellis's interview on 'A Guide to Rational Living.']





**Q.6. Answer the following questions in detail.**

**\*1. Explain the key features of science.**

**Ans:**

- i. Empirical evidence:** Empirical evidence refers to acquiring information through direct observation or experiments. Scientific knowledge is based on verifiable evidence so that other investigators can observe or measure the same phenomena and verify its accuracy in future.
- ii. Objectivity:** Objectivity means the ability to see and accept the facts as they are and not as the investigator might wish them to be. Science objectively studies the phenomenon under consideration. So, all personal biases, prejudices, beliefs, wishes, values and preferences of a researcher are set aside while investigating a particular phenomenon.
- iii. Scientific causality:** Science aims at finding out the cause and effect relationship between variables under consideration. In any scientific study, a researcher attempts to find out the effect of the independent variable (cause) on the dependent variable<sup>Ⓒ</sup> (effect) by controlling all extraneous (unimportant) variables.
- iv. Systematic exploration:** Science systematically explores a phenomenon by adopting certain sequential procedure. Sequential procedure includes steps like identifying the problem, formulation of hypothesis, collection of facts, analysis of facts, scientific generalisation and prediction.

- v. Replication:** Replication means the ability to reproduce scientific knowledge under the same stated circumstances, anywhere and anytime. Replication assures the reliability of results. It also enables in establishing a scientific theory.
- vi. Predictability:** Scientists not only describe the phenomena being studied but also attempt to explain it and make predictions accordingly.

**\*2. Write detailed information of the experimental method in psychology.**

**Ans:**

- i.** Experimental method is one of the scientific methods to study behaviour.
- ii.** In experimental method, experimenter conducts experiments on participants<sup>Ⓒ</sup> by following certain steps. These steps are:
  - a.** Identifying problem
  - b.** Developing hypothesis
  - c.** Selecting an experimental design and standardising the experimental procedure
  - d.** Conducting experiment and collecting data
  - e.** Analysing data
  - f.** Drawing conclusions
- iii.** Some of the important features of experimental method are as follows:
  - a.** It is one of the most objective methods of collecting data.
  - b.** It facilitates accurate observations under controlled conditions.
  - c.** It helps in finding out the cause and effect relationship between two or more variables.
  - d.** The findings of the experimental method are verifiable.
- iv.** Experimental method has assigned the status of science to Psychology.

**\*3. Explain the types of correlation.**

**Ans:**

Type	Meaning	Value of correlation coefficient	Example
<b>Positive</b>	Both variables either increase or decrease at the same time.	Between 0.00 and +1.00	Higher the amount of practice, greater the chances of success. So, practice and success are positively correlated.
<b>Negative</b>	An increase in one variable is associated with a decrease in the other and vice versa.	Between 0.00 to -1.00	Higher the expenses, lower the amount of savings. So, expenses and amount of savings are negatively correlated.
<b>Zero</b>	Here, any change in one variable brings no significant change in other variable.	Zero	The level of income is not related with relation with neighbours. So, income level and relation with neighbours are not correlated.





**\*4. Explain some of the challenges in establishing psychology as a science.**

**Ans:** Although Psychology is considered to be a scientific discipline, it is criticised on theoretical, practical, ethical and philosophical grounds. The following controversies and criticisms represent the challenges in establishing Psychology as a science:

- i. Psychology is in pre-paradigmatic state:** Unlike mature and natural sciences, Psychology is a social science and it is a comparatively younger discipline of knowledge. Thomas Kuhn (philosopher) asserts that Psychology is still in a pre-paradigmatic state. It means Psychology has not yet succeeded in producing a cumulative body of knowledge having a clear conceptual core and agreed upon by experts in Psychology.
- ii. Issues related to predictability and replicability:** A major goal of Psychology is to predict human behaviour by understanding underlying causes. However, making exact predictions is difficult because people respond differently in different situations. Human behaviour is more difficult to study than particles and chemical compounds. Therefore, the test results in Psychology are more varied, harder to control and difficult to replicate.
- iii. Objectifying humans:** Some existential and humanistic psychologists criticise that psychologists objectify people by subjecting them to experimentation. Since Psychology treats human beings as things or as objects that can be examined by experiments, it is sometimes portrayed as dehumanising what is most essential about being human.

**\*5. Explain some of the characteristics of a rational individual.**

**Ans:**

- i. Understanding self-interest and social interest:** Rational people understand what helps them to grow and promote themselves. They take the responsibility of making choices which enable them to grow. Additionally, rational people take care of not violating other person's rights while achieving their own interests. They consider the interests of society in which they live along with their self-interests.
- ii. Self-direction:** Rational people assume primary responsibility for their own lives. They do not demand or need excessive support or nurturance from others.
- iii. Tolerance:** Rational people are highly tolerant, i.e. they respect individual differences between people.

They also accept one's own and others' right to be wrong, i.e. they accept the fact that human being can make mistakes.

- iv. Self-acceptance and self-responsibility:** Rational people accept themselves unconditionally with all their strengths and flaws. They also accept the responsibility for their own thoughts, beliefs, feelings and behaviour.

**Q.7. Answer the following questions with the help of the given points. [5 Marks each]**

**1. Explain the history of Psychology as a science with respect to:**

- i. Emergence of Structuralism**
- ii. Emergence of Functionalism**
- iii. Emergence of Psychoanalysis**
- iv. Emergence of Behaviourism**
- v. Emergence of Humanistic Psychology**
- vi. Emergence of Cognitivism**

**Ans:**

- i.** Structuralism is widely regarded as the first school of thought in Psychology. Wilhelm Wundt and his student Edward B. Titchener advocated Structuralism. Wilhelm Wundt used the method of introspection to study conscious experiences like sensation and perception.
- ii.** Functionalism was advocated by William James. He emphasised on the study of human consciousness. James is known as the father of 'American Psychology'.
- iii.** A theory of Psychoanalysis was proposed by an Austrian physician Sigmund Freud in early 1890s. In contrast to the early schools of thoughts, Freud gave importance to the study of the unconscious mind.
- iv.** A new school of thought called Behaviourism was advocated by an American psychologist John B. Watson during the early 20<sup>th</sup> century. Behaviourism rejected both, the study of conscious experiences and unconscious mind. It made psychology a more scientific discipline by focusing on the study of observable behaviours.



**GG - Gyan Guru**

S-O-R Model (Stimulus-Organism-Response) given by John Watson explains the fact that individuals behave in different ways when they are exposed to the exact same stimulus. Behavioural Psychology studies these differences by scientifically observing behaviour.





- v. During the second half of the 20<sup>th</sup> century, a new perspective called Humanistic Psychology was advocated by an American psychologist Carl Rogers. Humanistic psychology stressed upon the study of power of free will, self-determination and self-actualisation.
- vi. A new perspective known as Cognitivism replaced Psychoanalysis and Behaviourism during the 1950s and 1960s. American psychologist Ulric Neisser is generally considered as the founder of Cognitivism. Researchers in Cognitive Psychology study higher cognitive processes like memory, decision-making, problem-solving, intelligence and language with tools like MRI and PET scans.

### Q.8. How rational am I?

- \*1. Identify the strongest and the weakest characteristics in you from those explained by Dr. Albert Ellis.**

**Ans:**

- i. The strongest characteristic in me is tolerance. I understand that all people are different. So, I respect others' opinion even when it is completely different than mine. I never impose my feelings, thoughts or beliefs on anyone and always have the willingness to understand others' point of view. I don't judge others as being 'wrong' just because their ways of thinking and behaving are different than my ideologies.
- ii. The weakest characteristic in me is excessive dependence on my family and close friends. I believe that sometimes I depend on them for love and support a little more than I should. Hence, I feel I need to be more self-reliant in order to grow as a person.

- \*2. How will you work on your weakest characteristic? Write two strategies.**

**Ans:** To work on my weakest characteristics, I will:

- i. Be more independent and take charge of my life. I will convince my self that no one else in this world is responsible for my happiness but myself. Hence, I'll cease to confuse my needs with someone else's responsibilities.
- ii. Be more selfish and focus on my emotional well being. Being selfish does not necessarily mean that you trample someone's happiness and prioritise your own. It simply means that you're concerned with your own well-being and love yourself enough without harming anyone else. To pursue this, I'll heal my mind through meditation. This will help me let go of all the emotional dependency and allow me to introspect and reinvent myself.



**GG - Gyan Guru**

In a book titled 'The Virtue of Selfishness', Ayn Rand states that 'selfishness' is a virtue. According to her, selfishness is the "concern with one's own interests". So, the word 'selfishness' is not a synonym of evil and being selfish helps one to lead a healthy, purposeful and fulfilling life.

### Activities

**[Note: The answers of activities will be very subjective. The answers provided are for reference.]**

1. Read the following statements. Think and discuss whether the given statements are facts or myths and misconceptions about Psychology:
  - i. Psychology is just common sense and not a real science.
  - ii. Psychology is simply a pseudoscience.
  - iii. Psychologists are simply mind readers or the face readers.
  - iv. Psychology is related only to the study of crazy people who are in need of therapy.
  - v. Psychologists, psychiatrists and counsellors have the same professional qualifications and their jobs are almost of the same nature.
  - vi. Anyone with a degree in Psychology can provide counselling to a needy person.

*(Textbook pg. no 1)*

**Ans:** I feel all of the above are myths. Psychology being a social science, it is definitely different than natural sciences. But that does not mean that Psychology is not a real science. Psychologists are not mind readers. They try to understand and predict human behaviour with the help of various scientific techniques. Psychologists study different aspects of human behaviour and suggest how mental well-being can be improved. Psychiatrists are medical doctors that prescribe medication, diagnose illness and manage treatment. A counsellor is a trained professional who provides advice and solutions for coping with stress or sadness. A psychologist however must have extensive knowledge of the discipline as well as practical experience in order to provide counselling to a needy person.



2. Read the following statements and discuss about the same in the classroom.
  - i. Psychology is a science because it fulfills many conditions of science.
  - ii. Psychology is not an exact science like Physics or Chemistry.
  - iii. Psychology is a social science that studies human (and animal) behavior and mental processes.
  - iv. Psychology uses some objective research methods, it examines cause-and-effect relationships to produce laws governing human behavior and its findings can be verified.
  - v. Psychology can be distinguished from pseudoscience and folk wisdom as Psychology has evidence against its theories.
  - vi. The subject matter of Psychology is complex as human behavior is dynamic and the mental processes are abstract. Therefore, the theories of Psychology are not as universal, exact and precise as those in Physics and Chemistry.

*(Textbook pg. no 3)*

*(Students are expected to do this activity on their own)*

3. Visit the website given below and collect information about various schools of thought of Psychology:  
<https://www.verywellmind.com/psychology-schoolsof-thought-2795247>

*(Textbook pg. no 4)*

*(Students are expected to do this activity on their own)*

4. Learn the Key Terms of experimental method with the help of given example:
  - i. **Problem:** To study the effect of music on the level of blood pressure.
  - ii. **Hypothesis:** The music will help in regulating the level of blood pressure.
  - iii. **Independent variable:** Music.
  - iv. **Dependent variable:** Level of blood pressure.
  - v. **Intervening variables:** Age, gender, all other sounds other than music.
  - vi. **Experimenter:** A person who will be conducting this experiment. (Maybe you or your psychology teacher.)
  - vii. **Participant:** A person on whom this experiment will be conducted. (May be your family member/ friend.)

*(Textbook pg. no 4)*

**Ans:**

- i. **Problem:** A phenomenon or aspect of human behaviour to be studied.
- ii. **Hypothesis:** A proposed explanation for a phenomenon given as a starting point for further investigation.

- iii. **Independent variable:** A variable which is controlled and does not depend on other variable considered in a study.
  - iv. **Dependent variable:** A variable whose value is determined by the independent variable.
  - v. **Intervening variables:** Other variable which may influence the value of dependent variable.
  - vi. **Experimenter:** A person who will be conducting the experiment to find whether the hypothesis is correct or not.
  - vii. **Participant:** A person on whom the experiment is conducted by the researcher.
5. Find out the independent variable and dependent variable from the experiment ideas given below:
    - i. To study the effect of practice on memory.
    - ii. To study the effect of mental set on problem solving.
    - iii. To study the effect of noise pollution on the speed of writing.
    - iv. To study the effect of colour on perception.
    - v. To study the effect of feedback on decision-making.

*(Textbook pg. no 5)*

**Ans:**

- i. Independent variable: Practice  
Dependent variable: Memory
- ii. Independent variable: Mental set  
Dependent variable: Problem solving
- iii. Independent variable: Noise pollution  
Dependent variable: Speed of writing
- iv. Independent variable: Colour  
Dependent variable: Perception
- v. Independent variable: Feedback  
Dependent variable: Decision-making

6. Conduct the following experiment and find out whether the color of text has any impact on memory:
  - i. Randomly assign participants to two groups. (See to it that age, gender, cultural background, etc. of all participants is same.)
  - ii. Ask one group to read a list of 20 words written in black ink for 5 minutes.
  - iii. Ask the second group to read a list of the same 20 words for the same amount of time, but instead written in green ink.
  - iv. After 5 minutes, ask participants from both the group to write down as many words as they can recall on a plain paper.
  - v. Compare the recall scores and conclude.

*(Textbook pg. no 5)*

*(Students are expected to do this activity on their own)*



7. Discuss about the following topics which can be studied using survey method :
  - i. Determinants of job satisfaction
  - ii. The problems of working women
  - iii. Exercise and physical health
  - iv. Causes of students absenteeism
  - v. Causes of alcoholism
  - vi. Addiction to virtual online games
  - vii. Social networking and cyber-crimes
  - viii. Problems faced by senior citizens

*(Textbook pg. no 5)*

*(Students are expected to do this activity on their own)*

8. Discuss about the following topics which can be studied using observation method:
  - i. Aggressive tendencies shown by teenagers
  - ii. Reactions of passengers stuck in heavy traffic
  - iii. Body language of students participating in the elocution competition
  - iv. Civic sense shown at public places
  - v. Student’s behaviour at the book exhibition

*(Textbook pg. no 6)*

*(Students are expected to do this activity on their own)*

9. Read the following well known classical case. **The Case of “Anna O.”**

“Anna O” (Real name: Bertha Pappenheim) was suffering from a variety of odd physical and psychological symptoms. One of them was that for several weeks she was unable to drink any fluids.

“Anna O” would pick up the glass of water, but as soon as it touched her lips she would push it away like someone suffering from hydrophobia. “Anna O” lived only on fruit, such as melons, etc., so as to lessen her tormenting thirst.

During hypnosis, “Anna O” grumbled about her English “lady-companion,” whom she did not care for, and went on to describe, with every sign of disgust, how she had once gone into this lady’s room and how her little dog had drunk out of a glass there. During hypnosis “Anna O” asked for something to drink, drank a large quantity of water without any difficulty and awoke from her hypnosis with the glass at her lips; and thereupon the disturbance (inability to drink water) vanished, never to return.

Freud’s interpretation was that “Anna O” had repressed the memory of incident (dog had drunk out of a glass) along with the emotion that it triggered and that this was what had

caused her inability to drink. Furthermore, during hypnosis, “Anna O's” recollection of the incident, along with her expression of the emotion she had repressed, caused the symptom to go away.

*(Textbook pg. no 6 and 7)*

*(Students are expected to do this activity on their own)*

10. Discuss about the following topics which can be studied using case history method:
  - i. A patient suffering from phobia
  - ii. A student suffering from dyslexia
  - iii. A farmer who attempted suicide
  - iv. A successful young entrepreneur
  - v. Gold medallist athlete

*(Textbook pg. no 7)*

*(Students are expected to do this activity on their own)*

11. Remember the information given in the following table:

Type of correlation	Variable 'X'	Variable 'Y'
Positive correlation	Rises ↑	Rises ↑
	Falls ↓	Falls ↓
Negative correlation	Rises ↑	Falls ↓
	Falls ↓	Rises ↑
Zero correlation	Rises ↑	No significant change
	Falls ↓	

*(Textbook pg. no 8)*

*(Students are expected to do this activity on their own)*

12. Discuss about the following topics that can be studied using correlation study method:
  - i. Bunking lectures and score in exams
  - ii. Weight and intelligence
  - iii. Amount of salary and level of job satisfaction
  - iv. Rehearsal and forgetting
  - v. Height and aptitude in music
  - vi. Urbanization and pollution
  - vii. Speed of vehicles and road accidents

*(Textbook pg. no 8)*

*(Students are expected to do this activity on their own)*

**Chapter Assessment**

Time: 1 hr

Total Marks: 25

- Q.1. Complete the following statements by selecting the appropriate words given in the brackets. [3]**
- Rational people are \_\_\_\_\_. (flexible, intolerant, unhappy)
  - \_\_\_\_\_ is considered as founder of Psychoanalysis. (Wilhelm Wundt, Carl Rogers, Sigmund Freud)
  - Case study is one of the \_\_\_\_\_ research methods used in Psychology. (quantitative, qualitative, primitive)
- Q.2. Answer the following questions in one sentence each. [2]**
- Who gave the values of rational living?
  - What is indicated by a sign of correlation coefficient?
- Q.3. Explain the following concepts in 25 to 30 words each. (Any 2) [4]**
- Practical Intelligence
  - Tolerance
  - Correlation
- Q.4. Write short notes on the following topics in 50 to 60 words each. (Any 2) [6]**
- Observation method
  - Importance of rationality
  - Survey method
- Q.5. Answer the following questions in 150 to 200 words each. (Any 1) [10]**
- Explain some of the challenges in establishing psychology as a science.
  - Explain the key features of science.

**Answers**

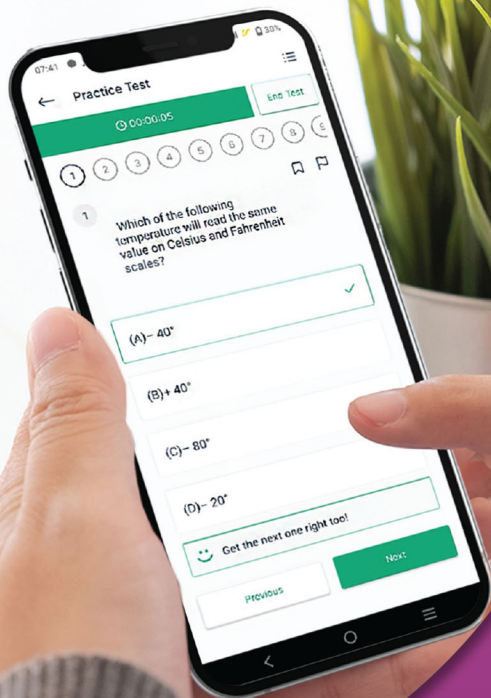
- Q.1.** 1. flexible 2. Sigmund Freud 3. qualitative
- Q.2.** 1. Dr. Albert Ellis gave the values of rational living.  
2. The sign (+ or –) of a correlation coefficient indicates the direction of the relationship between the variables.
- Q.3.** 1. Sternberg and his colleagues suggested that Practical Intelligence can be defined as ‘The ability to perform successfully in naturalistic settings in a way that is consistent with one’s goal’.  
2. Tolerance is the willingness to accept behaviour and beliefs of others that are different from one’s own. It is one of the characteristics of rational people.  
3. Correlation is a statistical tool used to measure the relationship between two or more variables. If the change in one variable appears to be accompanied by a change in the other variable, the two variables are said to be correlated and this interdependence is called correlation.
- Q.4.** 1.  
i. Observation method is a type of research method. It is very useful when experiments cannot be conducted.  
ii. It is widely used by child psychologists, clinical psychologist and social psychologists.  
iii. In observation method, behaviour is observed in a natural or laboratory setting.  
iv. Observation carried out in a natural setting is called natural observation while observation carried out in a laboratory setting is called controlled observation.  
v. Observation method can be treated as a scientific method. It is beneficial when it is used for a specific purpose of research and is planned in a systematic way.
2.  
i. Stanovich and his colleagues stated that rationality involves adaptive reasoning, good judgement and good decision making.  
ii. According to Dr. Albert Ellis, rationality as a personal philosophy helps an individual to attain many goals in life and to be happy.



- iii. Rationality also ensures that a person does not compromise on social norms, values and ethics for the sake of his own happiness.
  - iv. A rational person's emotions, thoughts and acts do not get driven by irrational influences.
  - v. In short, rationality contributes to psychological well-being of a person and thereby, improves the quality of life.
- 3.
- i. A survey is defined as a research method used for collecting data from a pre-defined group of respondents (sample) so as to gain information and insights on various topics of interest such as political opinions, consumers' preferences, etc.
  - ii. Survey method collects the required information with the help of questionnaires, checklists, rating scales, inventories and interviews.
  - iii. Surveys can be undertaken using email, telephonic calls or direct interaction with respondents.
  - iv. Survey method is an economic and an efficient method of data collection.
  - v. It is largely used by social psychologists, educational psychologists and industrial psychologists.

- Q.5.**
1. Although Psychology is considered to be a scientific discipline, it is criticised on theoretical, practical, ethical and philosophical grounds. The following controversies and criticisms represent the challenges in establishing Psychology as a science:
    - i. **Psychology is in pre-paradigmatic state:** Unlike mature and natural sciences, Psychology is a social science and it is a comparatively younger discipline of knowledge. Thomas Kuhn (philosopher) asserts that Psychology is still in a pre-paradigmatic state. It means Psychology has not yet succeeded in producing a cumulative body of knowledge having a clear conceptual core and agreed upon by experts in Psychology.
    - ii. **Issues related to predictability and replicability:** A major goal of Psychology is to predict human behaviour by understanding underlying causes. However, making exact predictions is difficult because people respond differently in different situations. Human behaviour is more difficult to study than particles and chemical compounds. Therefore, the test results in Psychology are more varied, harder to control and difficult to replicate.
    - iii. **Objectifying humans:** Some existential and humanistic psychologists criticise that psychologists objectify people by subjecting them to experimentation. Since Psychology treats human beings as things or as objects that can be examined by experiments, it is sometimes portrayed as dehumanising what is most essential about being human.
  2. The key features of science are as follows:
    - i. **Empirical evidence:** Empirical evidence refers to acquiring information through direct observation or experiments. Scientific knowledge is based on verifiable evidence so that other investigators can observe or measure the same phenomena and verify its accuracy in future.
    - ii. **Objectivity:** Objectivity means the ability to see and accept the facts as they are and not as the investigator might wish them to be. Science objectively studies the phenomenon under consideration. So, all personal biases, prejudices, beliefs, wishes, values and preferences of a researcher are set aside while investigating a particular phenomenon.
    - iii. **Scientific causality:** Science aims at finding out the cause and effect relationship between variables under consideration. In any scientific study, a researcher attempts to find out the effect of the independent variable (cause) on the dependent variable (effect) by controlling all extraneous (unimportant) variables.
    - iv. **Systematic exploration:** Science systematically explores a phenomenon by adopting certain sequential procedure. Sequential procedure includes steps like identifying the problem, formulation of hypothesis, collection of facts, analysis of facts, scientific generalisation and prediction.
    - v. **Replication:** Replication means the ability to reproduce scientific knowledge under the same stated circumstances, anywhere and anytime. Replication assures the reliability of results. It also enables in establishing a scientific theory.
    - vi. **Predictability:** Scientists not only describe the phenomena being studied but also attempt to explain it and make predictions accordingly.





Give your XII<sup>th</sup> exam preparation the  
**TECHNOLOGY BOOST!**

Practice more than  
**4,500 MCQs**  
for just

Use Coupon Code  
**QUILLPADHAI2023**



Also available for X<sup>th</sup>, XI<sup>th</sup>, MHT-CET, NEET & JEE

- Practice chapter-wise & full syllabus MCQs in test format
- Get instant verification of your answer
- Detailed analysis of every test on completion
- Option to save questions for future reference

Visit our website to know more about our  
range of books for **X<sup>th</sup>, XI<sup>th</sup>, MHT-CET, NEET & JEE**

**Visit Our Website**

**Target Publications® Pvt. Ltd.**  
Transforming lives through learning.

**Address:**

2<sup>nd</sup> floor, Aroto Industrial Premises CHS,  
Above Surya Eye Hospital, 63-A, P. K. Road,  
Mulund (W), Mumbai 400 080

**Tel:** 88799 39712 / 13 / 14 / 15

**Website:** www.targetpublications.org

**Email:** mail@targetpublications.org



Explore  
our range of  
**STATIONERY**

