SAMPLE CONTENT

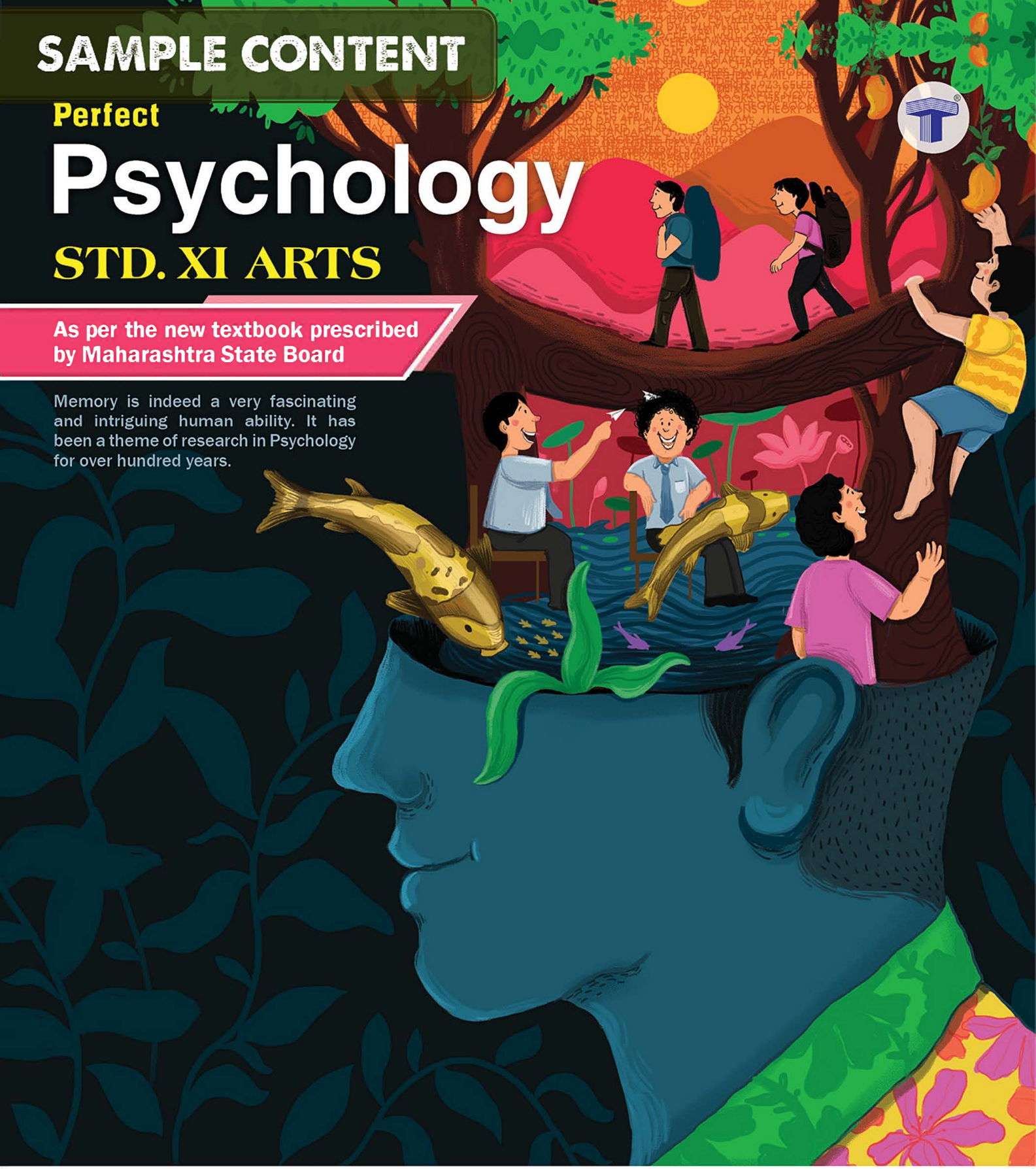
Perfect

Psychology

STD. XI ARTS

As per the new textbook prescribed by Maharashtra State Board

Memory is indeed a very fascinating and intriguing human ability. It has been a theme of research in Psychology for over hundred years.



Target Publications® Pvt. Ltd.

Written as per the latest textbook prescribed by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune.

PERFECT Psychology

Std. XI Arts

Salient Features

- Based on the new textbook
- Exhaustive content coverage in Question and Answer format
- Wide variety of questions in each chapter
- 'Chapter overview' to enable quick revision of key points
- Includes 'Gyan Guru' (GG) that offers a practical touch to theory
- 'For your understanding' section aids conceptual clarity
- Includes 'QR Codes' to refer relevant content
- Coverage of the 'Activity' section
- Chapter assessment at the end of every chapter for self evaluation with answer key

Sample Content

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PREFACE

Perfect Psychology Std. XI aims to provide information about cognitive and neural sciences. It gives us a scientific account of how the mind works. It is based on the latest curriculum developed by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. It encompasses a precise and critical account of the fundamentals of Psychology, its branches and the pivotal role played by the nervous system.

This book addresses philosophical content in a way that is accessible to readers with little or no background in Psychology or Neuroscience. Using application based questions it examines perception and action. The result is an integrated and comprehensive overview of much of the architecture of the mind, which will be valuable for both students and teachers of Psychology and Cognitive science.

It is imperative to understand the forms of personalities and what impacts the behaviour of people. The key features of the book include *Chapter Overview, Gyan Guru, For your understanding, QR Codes and Chapter Assessment*. The book also comprises of developmental, behavioural and neural studies which would not only help the students remember and understand the fundamentals but also encourage them to ponder and debate further.

The latest education policy recommends that children's life at the educational institution must be linked to their life outside it. Therefore, a practical perspective has been presented by contextualizing the theories through probable instances. The syllabi and textbooks developed on the basis of the new education policy signify an attempt to enhance a student's learning experience.

We hope that students as well as teachers find this book lucid and purposeful.

- Publisher

Edition: First

The journey to create a complete book is replete 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

Disclaimer

This reference book is transformative work based on textbook 'Psychology'; First edition: 2019 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.

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Sample Content

FEATURES

Chapter Overview

Introduction	1. Psychology is an important science in modern times. 2. The scope of Psychology is getting wider with the emergence of new branches. 3. Today, there are more than 50 branches of Psychology that help to study human behaviour from different angles.

Chapter Overview

After reading a chapter from the 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.

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.

GG - Gyan Guru

In 1936, Hans Selye wrote a book, 'The Stress of Life' in Hungarian which became a bestseller. In 1975, he created the International Institute of Stress.
Selye Janos University, the only Hungarian language university in Slovakia, was named after him.

For your understanding

Primacy effect is the tendency to remember the first piece of information that we encounter in a better manner than the information presented later on. Conversely, recency effect is the tendency to remember the most recent information in a better way.

For your understanding

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

QR Code

QR codes given throughout the book enable students to access relevant content for the given topic.

[Note:
Scan QR code to watch video on how to change our 'body image', i.e., the way we see ourselves?]

Sample Content

FEATURES

Chapter Assessment

Time: 1.30 hrs. **Total Marks: 25**

Q.1. Complete the following statements. **[3]**

1. One of the criteria of well-adjusted behaviour is _____.
   (A) intelligence
   (B) openness to new experience
   (C) success
   (D) artistic ability

2. A scale to measure self-esteem was developed by _____.
   (A) John Mayer (B) Peter Salovey
   (C) Morris Rosenberg (D) Daniel Goleman

3. _____ face the identity crisis.
   (A) Children (B) Adolescents
   (C) Young adults (D) Old people

Answers

Q.1. 1. openness to new experience
2. Morris Rosenberg
3. Adolescents

Chapter Assessment

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

Sample Content

CONTENTS

Note: 1. All textual questions are represented by * mark.

2. All questions based on intext content are represented by # mark.

7 Nervous System

Chapter Overview

Nervous system	1. Nervous system is the complex network of neurons that carry signals from brain to body and body to brain. 2. Our nervous system consists of two major parts, viz, Central Nervous System (CNS) and Peripheral Nervous System (PNS). 3. CNS consists of brain and spinal cord. 4. PNS consists of somatic and autonomic nervous system. 5. Somatic nervous system is further divided into sensory and motor system. 6. Autonomic nervous system is further divided into sympathetic and parasympathetic nervous system. 7. Neurons are the building blocks of nervous system. 8. A neuron consists of dendrites, axon, cell body and terminal button or telodendria. 9. Neurotransmitters are the chemical messengers. 10. Some important neurotransmitters are acetylcholine, dopamine, norepinephrine, serotonin, glutamate and GABA (Gama Amino Butyric Acid
Brain	1. The study of Psychology can't be complete without studying the brain. 2. Our brain helps to adapt to the environment and plays a crucial role in every aspect of life. 3. The brain consists of three major parts, viz. hind brain, mid brain and fore brain. 4. Hind brain consists of cerebellum, brain stem and reticular activation system. 5. Mid brain consists of two parts, viz. superior and inferior colliculus. 6. Fore brain consists of cerebrum. The outside cover of cerebrum is called as cerebral cortex. 7. The surface of cerebral cortex is divided into two halves: right and left hemisphere. 8. Each hemisphere is divided into four lobes, viz. frontal lobe, parietal lobe, occipital lobe and temporal lobe. 9. The limbic system is also an important part of the brain. 10. The limbic system consists of hippocampus, amygdala, thalamus and hypothalamus. 11. The various pillars of better brain functioning are physical and mental exercise, nutrition, tackling medical problems, sleep and relaxation, mental fitness as well as social interaction.
Spinal cord	1. The spinal cord extends from neck to waist. 2. Its main function is to send information from brain to body and from to body to brain. 3. It controls reflex actions like salivation, sneezing, knee jerk, blinking of eyes. 4. It is connected to the periphery through 31 pairs of spinal nerves. Each spinal nerve is joined to spinal cord through two routes: dorsal and ventral route.
Glands	1. Glands are specialised groups of cells or organs that secrete chemical substances. 2. There are many glands. All glands fall into two categories, viz. endocrine and exocrine. 3. Exocrine glands are also called as duct glands. e.g. sweat gland, tear gland etc. 4. Endocrine glands are called as ductless glands. e.g. pituitary gland, thyroid gland etc. 5. Endocrine glands secrete vital chemical substances called hormones. 6. Hormones have strong impact on human behaviour. 7. Over (hyper) or under (hypo) secretion of hormones may lead to a variety of problems.

Q.1. [A] Complete the following statements with appropriate options

*1. Brain is a part of _____ nervous system.
(A) central (B) peripheral
(C) somatic

*2. _____ nervous system prepares us for the fight or flight responses.
(A) Somatic
(B) Parasympathetic
(C) Sympathetic

Sample Content

*3. _____ are the building blocks of the nervous system.
(A) Cells (B) Neurons
(C) Tissues

4. _____ of the neuron absorbs the food and keeps the cell alive.
(A) Nucleus (B) Axon
(C) Cell body

*5. The gap between two neurons is called _____.
(A) synapse (B) joint
(C) vacuum

6. _____ plays a role mainly in cognition, reward, learning and memory.
(A) Acetylcholine (B) Dopamine
(C) Serotonin

7. Brain plays an important role in _____ mental processes like thinking, reasoning and emotions.
(A) higher order (B) lower order
(C) neutral

8. Cerebellum consists of _____ parts.
(A) two (B) three
(C) four

9. _____ is a vital centre of the brain.
(A) Medulla oblongata (B) Pons
(C) Fore brain

10. _____ is a bridge between forebrain and hindbrain.
(A) Pons (B) Mid brain
(C) Cerebrum

11. Cerebrum is the _____ part of the brain.
(A) largest (B) smallest
(C) insignificant

12. Each hemisphere of the brain is divided into _____ lobes.
(A) four (B) six
(C) two

13. _____ is called as relay station of the brain.
(A) Hippocampus (B) Thalamus
(C) Amygdala

14. _____ is called as the pleasure centre of our body.
(A) Hypothalamus (B) Occipital lobe
(C) Spinal cord

15. A protein in the brain called _____ is related to Alzheimer's disease.
(A) beta-amyloid plaque
(B) thyroxin
(C) gonad

16. Spinal cord is connected to the periphery through _____ pairs of spinal nerves.
(A) 25 (B) 13
(C) 31

17. The chemical substances secreted by endocrine glands are called _____.
(A) hormones (B) neurons
(C) axons

18. Hyposecretion of thyroxin leads to cretinism among _____.
(A) old people (B) children
(C) adults

19. In case of _____ a person loses his weight and experiences irritated mood, sleeplessness as well as sweaty palms.
(A) Myxedema (B) Acromegaly
(C) Grave's disease

20. _____ is secreted by the pancreas.
(A) Glycogen (B) Cortisone
(C) Progesterone

Answers:

1.	central	2.	Sympathetic
3.	Neurons	4.	Nucleus
5.	synapse	6.	Serotonin
7.	higher order	8.	two
9.	Medulla oblongata	10.	Mid brain
11.	largest	12.	four
13.	Thalamus	14.	Hypothalamus
15.	beta-amyloid plaque	16.	31
17.	hormones	18.	children
19.	Grave's disease	20.	Glycogen

Q.1. [B] Match the following pairs

*1.

Group 'A'		Group 'B'	
i.	Thyroxin	a.	Pituitary
ii.	Epinephrine	b.	Parathyroid
iii.	Parathormone	c.	Thyroid
iv.	Androgen	d.	Adrenal gland
v.	Somatotropin hormones	e.	Salivary gland
		f.	Sex glands

2.

Group 'A'		Group 'B'	
i.	Spinal cord	a.	PNS
ii.	Autonomic Nervous system	b.	Telodendria
iii.	Terminal Button	c.	Cerebrum
iv.	Reticular Formation	d.	CNS
		e.	Alarm clock of the body

Sample Content

Answers:

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

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

1. Human nervous system is highly developed amongst all living creatures.
2. The autonomic nervous system controls all internal activities of human body.
3. Dendrite is a gap between two neurons.
4. Glutamate is chief inhibitory neurotransmitter.
5. Brain consists of five major parts.
6. Brain stem is divided into medulla oblongata and pons.
7. Medulla oblongata receives messages from higher centres of the brain.
8. Reticular activation system is a bridge between two hemispheres.
9. Mid brain consists of superior and inferior colliculus.
10. Two hemispheres of the brain are connected by a bundle of fibres called as corpus callosum.

#11. If a person's left side of the body is paralysed, neurons from the left side of his body stop functioning.

12. Temporal lobe is in the cortex, just above th rs.
13. People who exercise regularly have hig r ris f developing Alzheimer's disease.
14. Human brain consumes 40% o body tot energy.
15. The spinal cord extends fro neck vais
16. Exocrine glands are also ca d as duc ss glands.
17. In myxedema, a pers beco s ve huge, lacks motivation and co plain bout akness.
18. Adrenal gland i known sex g d.

Answers:

1. True	2. True	3. False
4. Fals	5. lse	6. True
7. Tru	False	9. True
10. True	11. False	12. True
13	14. False	15. True
16. False	17. True	18. False

Q.1. [D] Identify the odd item from the following series of words

*1. Frontal lobe, Parietal lobe, Thalamus, Occipital lobe
*2. Dopamine, Serotonin, Norepinephrine, Uric acid, GABA
*3. Dendrite, Nucleus, Tectum, Axon, Synapse
*4. Knee jerk, Sneezing, Thinking, Blinking of eyes
*5. Thyroid, Sweat glands, Adrenal gland, Gonads, Pituitary gland

Answers:

1. Thalamus
2. Uric acid
3. Tectum
4. Thinking
5. Sweat glands

Q.1. [E] Identify which hormones with hypo secretion or hyper secretion wo d lea to the following conditions

*1. Abnormal height, gigantism
*2. Hyper activity, speedy metabo m
*3. Cretinism
*4. Stunted growth, dwarfism
*5. Myxedema, fatig , sl rishne epression
*6. Increased appe e, over a ivity, restlessness, lack of concentration
7. Grave's seas

A rs:

1. Hypersec Somatotropin
2. Hypers retion – Thyroxin
3. Hypose etion – Thyroxin
4. Hypo cretion – Somatotropin
5. Hyposecretion – Thyroxin
6. Hyposecretion – Insulin and glycogen
7. Hypersecretion – Thyroxin

Q.1. [F] Which part of the brain is involved in processing the following information?

*1. Smelling a flower
*2. Maintaining balance while standing upright
*3. Comprehending a speech
*4. Memorising a childhood experience
*5. Feeling touch
*6. Seeing a picture
*7. Feeling hungry
*8. Feeling afraid

Answers:

1. Occipital lobe	2. Cerebellum
3. Temporal Lobe	4. Frontal lobe
5. Parietal lobe	6. Occipital lobe
7. Hypothalamus	8. Amygdala

GG - Gyan Guru

A human brain consists of approximately one hundred billion neurons.

Sample Content

Q.2. [A] Explain the following concepts

1. Nervous system

Ans: Nervous system is the complex network of neurons that carry signals from brain to body and body to brain. Our nervous system consists of two major parts, viz, central nervous system and peripheral nervous system.

2. Cerebral cortex

Ans: Cerebral cortex is the grey coloured outside cover of cerebrum. It controls higher order mental processes such as attention, perception, learning and memory.

3. Reflex action

Ans: Reflex action is an involuntary and nearly instantaneous movement in response to stimulus. e.g. salivation, sneezing, knee jerk, blinking of eyes. These are quick and simple patterns of behaviour without the involvement of brain.

4. Glands

Ans: Glands are specialised groups of cells or organs that secrete chemical substances. There are many glands. All glands fall into two categories, viz. endocrine and exocrine.

Q.2. [B] Compare and contrast

***1. Sympathetic nervous system and Parasympathetic nervous system**

Ans: i. Sympathetic nervous system prepares our body to face stressful and threatening situations. It prepares us for 'fight or flight' reaction. On the other hand, parasympathetic nervous system takes over when the situation becomes normal.

ii. Example:

a. Situation: Suppose you are chased by a dog.

b. Sympathetic nervous system: Due to the functioning of this system, your heart beat and palpitation increases. You also start to sweat.

c. Parasympathetic nervous system: When PNS takes over, your heart rate, palpitation and sweating become normal. You regain cool and composed state due to the functioning of this system.

***2. Exocrine glands and Endocrine glands**

Ans: i. Exocrine glands directly release their secretions into the organ or tissue while endocrine glands secrete chemical substances into the bloodstream.

ii. Exocrine glands have separate ducts for its secretion and so, they are also called as duct glands. e.g. sweat gland and tear gland. On the other hand, endocrine glands are called as ductless gland as they don't have a separate duct. e.g. pituitary gland and thyroid gland.

Q.3. Answer the following questions in 35-40 words

1. Explain the classification of somatic nervous system.

Ans: i. Somatic nervous system is divided into sensory and motor system of the body.

ii. It consists of sensory nerves (afferent nerves) and motor nerves (efferent nerves). Sensory nerves send messages from the body to the brain and motor nerves send messages from the brain to the body.

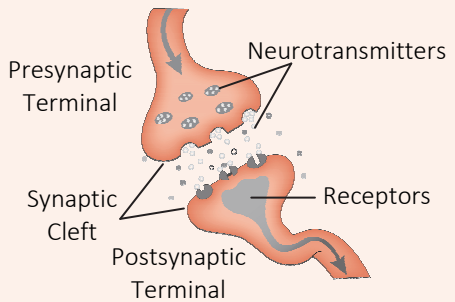
***2. What is a synapse? How does a nerve impulse travel from one to another neuron?**

Ans: i. Synapse is a gap between two neurons.

ii. The nerve impulse or neural message jumps across the synapse in order to reach to the dendrite of another neuron.

iii. When the neural message is passing through, it excites or inhibits the neurotransmitter in it. This chemical reaction decides our reaction to various situations.

For your understanding



Synapse

3. Why do we get different reactions to every situation?

Ans: i. When neural message passes from end buttons to dendrite of another neuron, it has to cross the chemical gap between two neurons (synapse).

ii. As neurons are not directly connected to each other, we don't have fixed reactions to every situation.

4. State any two functions of brain.

Ans: i. Brain helps to adapt to the environment and tries to analyse, store and synthesise the information it receives.

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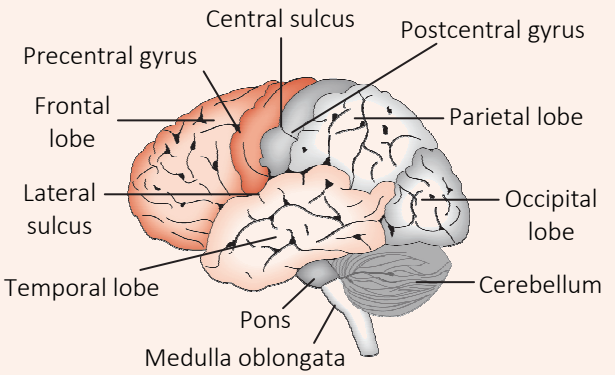
ii. Brain plays crucial role in every aspect of our lives like decision making, emotional experience and social interactions.

For your understanding



Human Brain

#5. Why are we supposed to wear helmet while riding a bike?

Ans: i. If someone meets with an accident while riding a bike, the person falls back on his head.

ii. Most of the time, his Medulla oblongata is damaged which will lead to instant death.

iii. Hence, we are supposed to wear helmet while riding a bike.

***6. Describe the functions of each of the four lobes.**

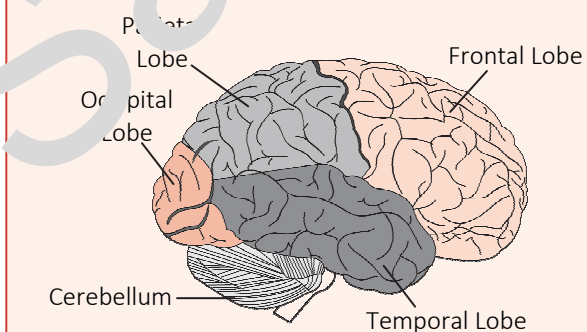
Ans: **i. Frontal lobe:** It controls motor actions, thinking, memory and reasoning. It has Broca's area which helps in speech production.

ii. Parietal lobe: It helps in understanding information regarding touch, pressure, pain and temperature.

iii. Occipital lobe: It is visual processing centre. It controls sense of hearing, smell and taste. It has Wernicke's area which helps in language understanding.

iv. Temporal Lobe: Hearing, understanding language, memory for language take place because of temporal lobe.

For your understanding



Human Brain Lobes

***7. Explain the functions of: Amygdala and Hippocampus.**

Ans: **i. Amygdala:** It stores emotional memories of experiences. We experience emotions, especially fear due to amygdala.

ii. Hippocampus: It is storage of long-term memories. If a person gets Alzheimer disease, his hippocampus is mainly affected.

***8. Explain the functions of hypothalamus.**

Ans: i. Hypothalamus controls many bodily needs i.e., primary needs of an individual like hunger, thirst, sex as well as temperature regulation and sleep.

ii. It is also called as the pleasure centre of our body.

***9. Which are the important parts of the hind brain? Explain their functions.**

Ans: Important parts of hind brain and their functions are as follows:

i. Cerebellum: It helps in maintaining body posture and body balance. It also helps in coordination of the movements.

ii. Brain stem: Medulla oblongata controls breathing rate, pulse rate, blood pressure and digestion. Pons sends and receives information from lower parts of the brain. It helps transmitting messages between cerebellum and cortex.

iii. Reticular activation system: Its main function is to maintain wakefulness, concentration and alertness.

[Note:
Scan QR code to watch Ted Talk by Dr. Lara Boyd on how one has the power to shape brain the way he wants.]

***10. How do endocrine glands affect our behaviour?**

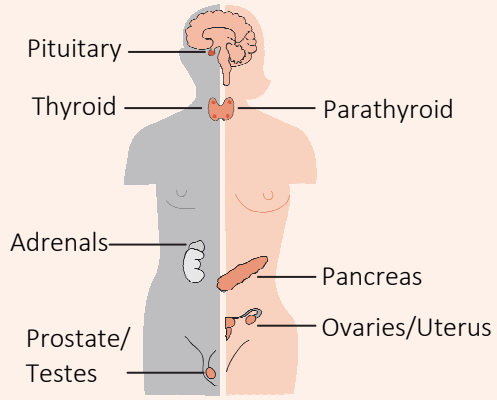
Ans: i. Endocrine glands secrete chemical substances called hormones.

ii. Hormones are like messengers that are responsible for certain behaviours or absence of reactions.

iii. e.g. Thyroid gland secretes thyroxin hormone. Its hypersecretion leads to Grave's disease while hyposecretion results in cretinism or myxedema.

Sample Content

For your understanding



Endocrine Glands

11. Explain the impact of hypersecretion of any four hormones.

Ans:

i. **Parathyroxin:** An individual experiences feeling of nausea, vomiting sensation. He also feels sleepy and relaxed.

ii. **Cortin or cortisone:** An individual experiences increased sexual drive. Females start looking like males.

iii. **Adrenalin and noradrenaline:** An individual experiences increased heartbeat, blood pressure and breathing rate.

iv. **Androgen and testosterone:** An individual shows tendency towards sexual behaviour. He feels very energetic and engages in aggressive behaviour.

12. Explain the impact of hyposecretion of any three hormones.

Ans:

i. **Parathyroxin:** An individual lacks motivation and energy. He experiences weakness, muscle cramps and spasm.

ii. **Cortin or cortisone:** An individual feels very lazy, lacks sexual drive and experiences loss of hunger and weight.

iii. **Androgen and testosterone:** Males do not have desire for sex and their voice remains childlike.

Q.4. Write short notes

Nervous system

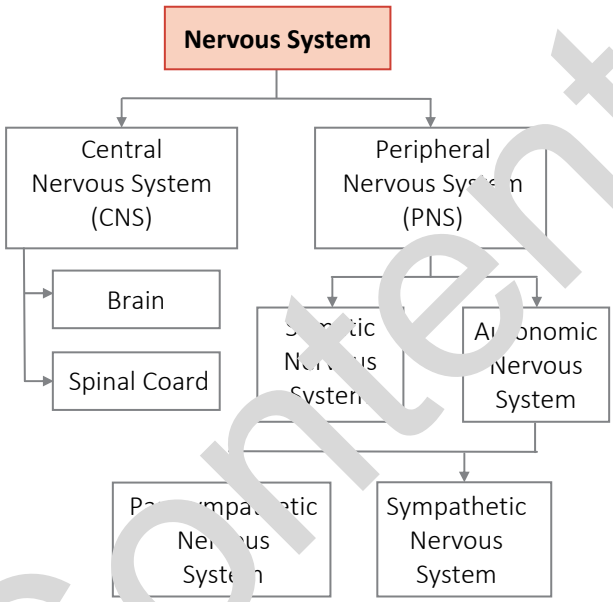
Ans:

i. Nervous system is the complex network of neurons that carry signals from brain to body and body to brain.

ii. Human nervous system is most complicated yet highly developed among all living creatures.

iii. Our nervous system consists of two major parts, viz, central nervous system and peripheral nervous system.

iv. Central nervous system consists of brain and spinal cord while peripheral nervous system consists of somatic and autonomic nervous system.



***2. Autonomic Nervous System**

Ans:

i. Autonomic nervous system controls internal activities of human body including heart rate, breathing, digestion, disposal of waste products and toxins.

ii. It is divided into sympathetic and parasympathetic nervous system.

iii. Sympathetic nervous system prepares our body to face stressful and threatening situations. It prepares us for 'flight or fight' reaction. The job of the system is just opposite to its name.

iv. Parasympathetic nervous system takes over when the situation becomes normal. It directs our body to store energy for emergencies.

***3. Neurotransmitters**

Ans: Neurotransmitters are the chemical messengers. The important neurotransmitters are:

i. **Acetylcholine:** It is a chemical released by motor neurons of nervous system to activate muscles.

ii. **Dopamine:** It is released by the brain. If the level of dopamine is normal, we experience happy, pleasant feeling. It also plays an important role in motivational process.

iii. **Norepinephrine:** It increases force of skeletal muscles, especially during fight or flight response.

Sample Content

iv. **Serotonin:** It plays a role mainly in cognition, reward, learning and memory. It also controls wakefulness, sleep, hunger, thirst and liking.

v. **Glutamate:** It helps in learning, memory and maintaining sugar level.

vi. **GABA (Gama Amino Butyric Acid):** It is chief inhibitory neurotransmitter i.e. its principal role is to reduce excitability of neurons throughout the nervous system. If it is less, it leads to convulsions and we cannot control body movements.

***4. Limbic System**

Ans: i. One of the important parts of the brain is limbic system.

ii. Hippocampus, amygdala, thalamus and hypothalamus are parts of limbic system.

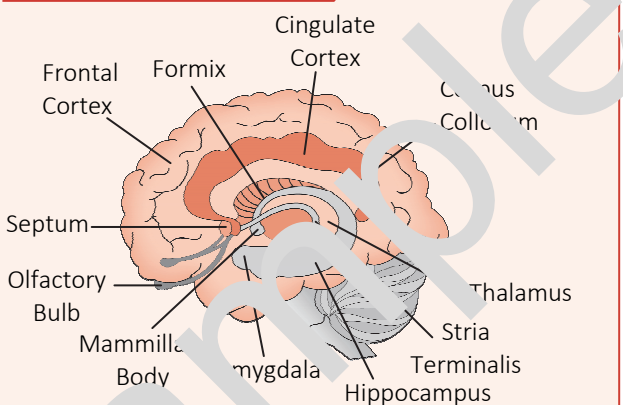
iii. Hippocampus is responsible for storage of long-term memories.

iv. Amygdala stores emotional memories of our experiences.

v. Thalamus is called as relay station of the brain. It receives all information from the body and sends it to various parts of brain.

vi. Hypothalamus controls major bodily needs like hunger, thirst, sex as well as temperature regulation and sleep.

For your understanding



Limbic System

5. Brain and nutrition

Ans: i. Nutrition plays an important role in brain functioning. Nutritional deficiency may lead to neurological problems.

ii. Despite representing only 2% of body's total mass, human brain consumes 20% of body's total energy due to increased metabolic need of human beings.

iii. Nutrition plays crucial role during developing years so to optimise the functions of brain. It is also essential during old age to avoid degeneration of cells.

iv. Nutrition enhances brain functioning. It prevents as well as help in treating neurological disorders.

v. As evolution took place, human life became more complicated and demanding. As a result, need for nutrition by the brain kept on increasing.

vi. Today human brain is exposed to high level of stress which results in oxidation. Any food which is high in antioxidants (almond, dark chocolate, onions, berries, mangoes, sea food) helps to control ill effects of oxidation.

6. Spinal Cord

Ans: i. Spinal cord is an important part of the central nervous system. It extends from neck to waist.

ii. Its main function is to send information from brain to body and from to body to brain.

iii. It controls reflex actions like salivation, knee jerk, blinking of eyes.

iv. Spinal cord is connected to the periphery through 31 pairs of spinal nerves.

v. Each spinal nerve is joined to spinal cord through two routes: dorsal and ventral route.

vi. If dorsal routes are injured, we will not have sensations while if ventral routes are injured, we will not be able to move our body and control reflex actions.

***7. Pituitary gland**

Ans: i. Pituitary gland is one of the endocrine glands, i.e., glands that secrete chemical substances into the bloodstream.

ii. It is also called as master gland as it helps other glands to produce their secretions and secretes majority of hormones.

iii. It consists of anterior lobe and posterior lobe.

iv. Anterior lobe: It secretes somatotropin, growth hormone and adrenocorticotropic hormone. It helps growth of the body and aids adrenal gland. The hormones secreted by this gland are also vital for nourishment of foetus.

v. Hypo or hypersecretion in anterior lobe: Hyposecretion leads to dwarfism, wherein a person is very short (two-three feet tall). On the other hand, hypersecretion can lead to gigantism, wherein a person becomes very huge and is eight-nine feet tall. Hypersecretion can also result in acromegaly, wherein a person has features of chimpanzee.

Sample Content

vi. Posterior lobe: It secretes oxytocin (which creates feeling of happiness), pituitrin (which helps smooth muscle functioning of stomach), thyrotrophic follicle stimulating luteinizing hormone (which helps in nourishment of foetus) and endorphins (which help to create neurotransmitters).

Q.5. Answer in 150-200 words

1. Write a note on neurons.

Ans:

i. Neurons are specialised network of cells that transmit messages from brain to body and from body to brain. They are basic unit of nervous system.

ii. Neuron consists of dendrites, axon, cell body and terminal button or telodendria.

iii. Cell body is the body of neuron. Nucleus of the neuron absorbs the food and keeps the cell alive.

iv. The neural message comes in through the dendrites. These are branch like structure.

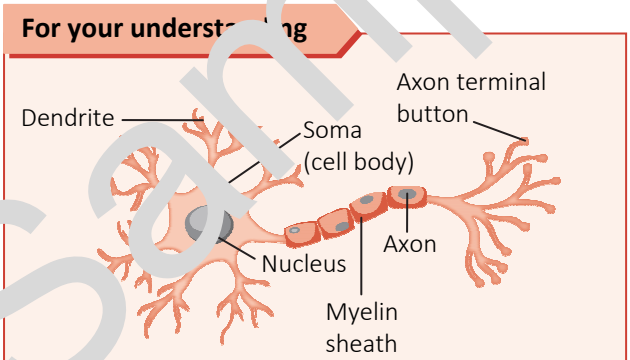
v. The neural message goes out from axon of the neuron.

vi. At the end of axon, there are end buttons. It is a bulb like structure containing chemicals known as neurotransmitters.

vii. Neurotransmitters are the chemical messengers. The neural messag jum across the synapse in order to reach to dendrite of another neuron.

viii. When the neural message is p through, it excites inh its the neurotransmitter in it. T chemical reaction decides ou reaction to various situations in li

For your understa ng



Neuron

***2. Explain the functions of various parts of the human brain.**

Ans: Brain consists of three major parts, viz. hind brain, mid brain and fore brain. Its functions are as follows:

i. Hind brain

a. Cerebellum: It helps in maintaining body posture and balance as well as aids in co-ordination of movements.

b. Brain stem: Medulla oblongata controls breathing rate, pulse rate, blood pressure and digestion. Pons h transmitting messages betwee cerebellum and cortex.

c. Reticular activation system: I s 'Ala clock' of the body. It aintains wakefulness, concentration and alertness.

ii. Mid brain

It sends informa to upp part of the brain and contro eye mov ments.

iii. Fore brain

a. Cereb um: C ebral cortex controls highe rder me al processes such as tion, perception, learning, mem y. Th surface of cerebral cortex is di ded into right and left hemi heres. Neurons from right hemisphere control left side of body and vice versa. Left hemisphere controls language, spatial relation and pattern recognition.

b. Four lobes: Frontal lobe controls motor actions, thinking, memory and reasoning. Parietal lobe helps us in understanding information regarding skin. Occipital lobe controls our vision. Temporal lobe is responsible for hearing, understanding language and memory for language.

3. Explain any five pillars of better brain functioning.

Ans:

i. Physical and mental exercise: Exercise improves blood flow and memory. It also stimulates chemical changes in the brain that improve learning, mood, and thinking.

ii. Tackling medical problems: Hypertension, diabetes, obesity, depression, head trauma, higher cholesterol and smoking increase the risk of dementia. One can control and reduce this risk by going for regular health check-ups and taking medication if required.

iii. Sleep and relaxation: Sleep energises the brain, improves mood and immune system by clearing wastage and toxins from the body. Practicing meditation and managing stress will help to control age-related decline in brain health.

Sample Content

iv. **Mental fitness:** It improves brain's functioning and promote new brain cell growth. This helps to decrease the chances of developing dementia. A person can keep his brain simulated by solving puzzles, watching stimulating movies or by learning something new.

v. **Social interaction:** It is good for brain health to spend time with others, participate in stimulating conversation, and stay connected with family and friends. Studies have shown that those who interact more show less decline in their memory.

***4. Explain the significance of endocrine glands in human behaviour.**

Ans: i. Endocrine glands secrete vital chemical substances called hormones. There is a strong impact of the hormones upon human behaviour.

ii. Hormones are responsible for certain behaviours or absence of reactions.

iii. Over (hyper) or under (hypo) secretion of hormones may lead to a variety of problems.

iv. e.g. Hypersecretion of insulin and glycogen hormones by pancreas reduces blood sugar level. It results in hyperglycaemia, wh[illegible] a person lacks energy and motiva[illegible]on, [illegible]y faint and go to coma. Cor[illegible]rsely, [illegible]e of hyposecretion, a person get[illegible] diab[illegible]s. H[illegible] becomes quite hungry and fee[illegible]very tired and restless. He [illegible]so s[illegible]ws [illegible]ritated behaviour and [illegible]es fre[illegible]uent and uncontrolled urination.

For your understa[illegible]ng

Some organs a[illegible] tissues [illegible]hich are not a part of the endocrine syst[illegible]n also secrete hormones. e.g. st[illegible]ach [illegible]lease[illegible]he hormone called gastrin.

[illegible]. State the [illegible]unctions of any five endocrine gland[illegible]in [illegible]etail.

[illegible]: Th[illegible] functions of five endocrine glands are as fo[illegible]ows:

Thyroid gland: It secretes thyroxin which maintains the rate of metabolism.

ii. **Parathyroid gland:** It secretes parathyroxin which maintains calcium as well as phosphate balance.

iii. **Pancreas:** It secretes insulin and glycogen that is responsible for maintaining blood sugar level.

iv. **Adrenal gland:** Cortex secretes cortin or cortisone which maintains the level of water, sugar and sodium. Medulla secretes adrenalin (which is associated with fear) and noradrenaline (which is associated with anger). Medulla plays important role in emotional excitement.

v. **Gonads (sex gland):** Testes in males secrete androgen and testosterone. These hormones are responsible for secondary sex characteristics in males. Th[illegible] voice becomes hoarse. They also get mo[illegible]tache and beard. Ovaries in fema[illegible]s se[illegible]ete estrogen and pro[illegible]ste[illegible]one. These hormones are res[illegible]nsible [illegible]r seco[illegible]dary sex characteristics in [illegible]males. As a result, feminine l[illegible] deve[illegible]nd menarche begins.

[illegible]ctivities

***1. Few [illegible]ctivities [illegible]re given below. Identify the syste[illegible] whic[illegible] dominates during these activitie[illegible]**

i. [illegible]cking up an object from the ground

ii. S[illegible]vering when we sense danger

iii. [illegible]eeling composed when we feel safe

iv. Increase in heart rate when we sense that we are going to meet with an accident

(Textbook pg. no 76)

Ans: i. Central nervous system

ii. Sympathetic nervous system

iii. Parasympathetic nervous system

iv. Sympathetic nervous system

***2. Think of the following actions. Which of them would be reflex actions and which of them will not be reflex actions?**

i. Throwing a ball in a cricket match

ii. Closing the eyes if someone brings a finger too close to them

iii. Removing the hand when you accidently touch a thorn

iv. Immediate movement of the knee when tapped just below it

v. Touching a hot object and pulling back your hand

(Textbook pg. no 80)

Ans: i. Reflex actions: ii, iii, iv, v

ii. Non-reflex actions: i

Sample Content

Chapter Assessment

Time: 1.30 hrs. **Total Marks: 25**

Q.1. Complete the following statements. **[3]**

1. Each hemisphere of the brain is divided into _____ lobes.
   (A) four (B) six (C) two
2. Hyposecretion of thyroxin leads to cretinism among _____.
   (A) old people (B) children (C) adults
3. _____ plays a role mainly in cognition, reward, learning and memory.
   (A) Acetylcholine (B) Dopamine (C) Serotonin

Q.2. State whether the following statements are true or false. **[2]**

1. Spinal cord extends from neck to waist.
2. Dendrite is a gap between two neurons.

Q.3. Answer the following questions in 35-40 words. (Any Two) **[4]**

1. Explain the impact of hyposecretion of any three hormones.
2. Explain the classification of somatic nervous system.
3. Describe the functions of each of the four lobes.

Q.4. Write short notes. (Any Two) **[6]**

1. Pituitary gland
2. Limbic System
3. Neurotransmitters

Q.5. Answer in 150-200 words. (Any One) **[10]**

1. Explain any five pillars of better brain functioning.
2. Explain the functions of various parts of the human brain.

Answers

Q.1. 1. four 2. Children 3. Serotonin

Q.2. 1. True 2. False

Q.3. 1. **i. Parathyroxin:** An individual lacks motivation and energy. He experiences weakness, muscle cramps and spasm.

ii. Cortin or cortisone: An individual feels very lazy, lacks sexual drive and experiences loss of hunger and weight.

iii. Androgen and testosterone: Males do not have desire for sex and their voice remains childlike.

2. i. Somatic nervous system is divided into sensory and motor system of the body.

ii. It consists of sensory nerves (afferent nerves) and motor nerves (efferent nerves). Sensory nerves send messages from the body to the brain and motor nerves send messages from the brain to the body.

3. **i. Frontal lobe:** It controls motor actions, thinking, memory and reasoning. It has Broca's area which helps in speech production.

ii. Parietal lobe: It helps in understanding information regarding skin like touch, pressure, pain and temperature.

iii. Occipital lobe: It is visual processing centre. It controls sense of hearing, smell and taste. It has Wernicke's area which helps in language understanding.

iv. Temporal Lobe: Hearing, understanding language, memory for language take place because of temporal lobe.

Q.4. 1. i. Pituitary gland is one of the endocrine glands, i.e., glands that secrete chemical substances into the bloodstream.

Sample Content

ii. It is also called as master gland as it helps other glands to produce their secretions and secretes majority of hormones.
iii. It consists of anterior lobe and posterior lobe.
iv. Anterior lobe: It secretes somatotropin, growth hormone and adrenocorticotropic hormone. It helps growth of the body and aids adrenal gland. The hormones secreted by this gland are also vital for nourishment of foetus.
v. Hypo or hypersecretion in anterior lobe: Hyposecretion leads to dwarfism, wherein a perso[illegible] very short (two-three feet tall). On the other hand, hypersecretion can lead to gigantism, wherein a person becomes very huge and is eight-nine feet tall. Hypersecretion can also [illegible] in acromegaly, wherein a person has features of chimpanzee.
vi. Posterior lobe: It secretes oxytocin (which creates feeling of happiness), pituitrin (w[illegible]ch helps smooth muscle functioning of stomach), thyrotrophic follicle stimulating lut[illegible]ng hormone (which helps in nourishment of foetus) and endorphins (which help to create n[illegible]urotr[illegible]smitte[illegible]).

2. i. One of the important parts of the brain is limbic system.
ii. Hippocampus, amygdala, thalamus and hypothalamus are parts of limbic s[illegible]tem.
iii. Hippocampus is responsible for storage of long-term memories.
iv. Amygdala stores emotional memories of our experiences.
v. Thalamus is called as relay station of the brain. It receives all infe[illegible]nation fr[illegible]n the body and sends it to various parts of brain.
vi. Hypothalamus controls major bodily needs like hu[illegible]ger, th[illegible]t, sex as well as temperature regulation and sleep.

3. Neurotransmitters are the chemical messen[illegible]rs. The important [illegible]urotransmitters are:
i. Acetylcholine: It is a chemical released [illegible] motor neur[illegible]s of nervous system to activate muscles.
ii. Dopamine: It is released by the brain. I[illegible]he level of [illegible]opamine is normal, we experience happy, pleasant feeling. It also plays an important r[illegible] in m[illegible]ivational process.
iii. Norepinephrine: It increases force of skeletal muscles, especially during fight or flight response.
iv. Serotonin: It plays a role m[illegible], in cognition, reward, learning and memory. It also controls wakefulness, sleep, hunger, [illegible]hirst [illegible]d liking.
v. Glutamate: It helps i[illegible]learni[illegible]memo[illegible] and maintaining sugar level.
vi. GABA (Gama Amino Bu[illegible]ric A[illegible]): [illegible]s chief inhibitory neurotransmitter i.e. its principal role is to reduce excitabilit[illegible]neur[illegible]s throughout the nervous system. If it is less, it leads to convulsions and we cannot [illegible]ontrol [illegible]dy m[illegible]vements.

Q.5. 1. **i. Physical and m[illegible]ntal ex[illegible]rcise:** Exercise improves blood flow and memory. It also stimulates chemic[illegible] ch[illegible]nges i[illegible]e brain that improve learning, mood, and thinking.
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iii. Sle[illegible] and relaxation: Sleep energises the brain, improves mood and immune system by clearing [illegible]vasta[illegible] and toxins from the body. Practicing meditation and managing stress will help to control a[illegible]related decline in brain health.
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b. **Brain stem:** Medulla oblongata controls breathing rate, pulse rate, blood pressure and digestion. Pons helps transmitting messages between cerebellum and cortex.

c. **Reticular activation system:** It is 'Alarm clock' of the body. It maintains wakefulness, concentration and alertness.

ii. **Mid brain**

It sends information to the upper part of the brain and controls eye movements.

iii. **Fore brain**

a. **Cerebrum:** Cerebral cortex controls higher order mental processes such as attention, perception, learning, memory. The surface of cerebral cortex is divided into right and left hemispheres. Neurons from right hemisphere control left side of body and vice versa. Left hemisphere controls language, spatial relation and pattern recognition.

b. **Four lobes:** Frontal lobe controls motor actions, thinking, memory and reasoning. Parietal lobe helps us in understanding information regarding skin. Occipital lobe controls our vision. Temporal lobe is responsible for hearing, understanding language and memory for language.

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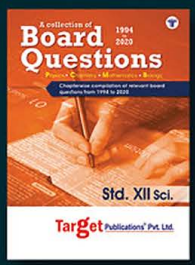

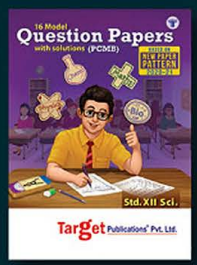

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