3.1 Divisions of the Nervous System and Neural Pathways

- **Central Nervous System (CNS)** – Consists of the brain and spinal cord, responsible for processing information.
- **Peripheral Nervous System (PNS)** – Consists of the somatic and autonomic nervous systems, transmitting signals between the CNS and the rest of the body.
- **Somatic Nervous System (SNS)** – Part of the PNS, containing sensory and motor neurons that control voluntary movements.
- **Autonomic Nervous System (ANS)** – Part of the PNS, controlling involuntary functions like heart rate and digestion.
- **Sympathetic Nervous System** – A division of the ANS that increases heart rate and breathing while slowing digestion.
- **Parasympathetic Nervous System** – A division of the ANS that slows heart rate and breathing while increasing digestion.
- **Sensory Neurons** – Neurons that carry impulses from sense organs to the CNS.
- **Motor Neurons** – Neurons that carry impulses from the CNS to muscles and glands.
- **Converging Pathway** – A neural pathway where multiple neurons send signals to one neuron, increasing sensitivity to stimuli.
- **Reverberating Pathway** – A neural pathway where neurons later in the pathway link back to earlier neurons, allowing repeated stimulation.

3.2 The Cerebral Cortex

- **Cerebral Cortex** – The outer layer of the brain responsible for conscious thought, memory, and decision-making.
- **Localisation of Function** – The idea that different areas of the brain are responsible for different functions.
- **Sensory Areas** – Regions of the cerebral cortex that process sensory information.
- **Motor Areas** – Regions of the cerebral cortex that control voluntary movements.
- **Association Areas** – Regions of the cerebral cortex involved in higher-order functions like personality, language, and intelligence.
- **Corpus Callosum** – A structure that connects the two cerebral hemispheres, allowing communication between them.
- **Hemispheric Lateralisation** – The concept that each hemisphere of the brain processes information from the opposite side of the body.

3.3 Memory

- **Encoding** – The process of converting information into a form that can be stored in the brain.
- **Storage** – The retention of information over time.
- **Retrieval** – The process of accessing stored information.
- **Sensory Memory** – A brief storage of sensory information lasting only a few seconds.
- **Short-Term Memory (STM)** – Memory storage with limited capacity and duration, holding information for a short time.
- **Long-Term Memory (LTM)** – Memory storage with unlimited capacity that can retain information for long periods.
- **Chunking** – A technique used to increase the capacity of STM by grouping information into larger units.
- **Rehearsal** – The repetition of information to help transfer it from STM to LTM.

- **Elaboration** – A deeper form of encoding that improves information retention.
- **Contextual Cues** – Factors such as time and place that help with memory retrieval.

3.4 The Cells of the Nervous System and Neurotransmitters at Synapses

- **Neuron** – A nerve cell that transmits electrical and chemical signals.
- **Dendrites** – Branch-like extensions of a neuron that receive signals from other neurons.
- **Axon** – The long fiber of a neuron that carries electrical impulses away from the cell body.
- **Myelin Sheath** – A fatty layer around axons that increases the speed of impulse conduction.
- **Glial Cells** – Cells that support neurons and produce the myelin sheath.
- **Neurotransmitter** – A chemical messenger that transmits signals across a synapse.
- **Synapse** – The junction between two neurons where neurotransmitters are released.
- **Receptors** – Proteins on the postsynaptic neuron that bind to neurotransmitters.
- **Reuptake** – The process of neurotransmitters being reabsorbed into the presynaptic neuron.
- **Summation** – The process where multiple weak stimuli combine to trigger an action potential.

3.5 Non-Specific Body Defences

- **Epithelial Cells** – Cells that form protective barriers on the body's surfaces.
- **Pathogen** – A microorganism that causes disease, such as a virus or bacterium.
- **Histamine** – A chemical released by mast cells that causes vasodilation and inflammation.
- **Vasodilation** – The widening of blood vessels, increasing blood flow to an area.
- **Phagocyte** – A type of white blood cell that engulfs and destroys pathogens.
- **Phagocytosis** – The process of a phagocyte engulfing and digesting a pathogen.
- **Lysosome** – An organelle in phagocytes that contains digestive enzymes to break down pathogens.
- **Cytokines** – Signalling proteins that attract more phagocytes to an infection site.

3.6 Specific Cellular Defences Against Pathogens

- **Lymphocyte** – A type of white blood cell involved in specific immune responses.
- **Antigen** – A molecule on the surface of pathogens that triggers an immune response.
- **B Lymphocyte** – A type of lymphocyte that produces antibodies.
- **T Lymphocyte** – A type of lymphocyte that destroys infected cells.
- **Antibody** – A Y-shaped protein that binds to antigens to neutralise pathogens.
- **Apoptosis** – Programmed cell death, triggered by T lymphocytes.
- **Autoimmune Disease** – A condition where the immune system attacks the body's own cells.
- **Memory Cells** – Lymphocytes that remain in the body after infection and provide long-term immunity.
- **HIV (Human Immunodeficiency Virus)** – A virus that attacks T lymphocytes, weakening the immune system.

- **AIDS (Acquired Immune Deficiency Syndrome)** – A condition resulting from HIV, leading to a weakened immune system.

3.7 Immunity

- **Vaccination** – The introduction of antigens to stimulate the immune system and create memory cells.
- **Adjuvant** – A substance added to vaccines to enhance the immune response.
- **Herd Immunity** – Protection from disease when a large percentage of a population is immunised.
- **Mass Vaccination Programme** – A public health initiative to immunise large populations against disease.
- **Antigenic Variation** – The ability of pathogens to change their antigens, making memory cells ineffective.
- **Clinical Trial** – A study conducted to test the safety and effectiveness of a vaccine or drug.

3.8 Clinical Trials and the Testing of Vaccines and Drugs

- **Randomised Trial** – A clinical trial where subjects are assigned to groups randomly to reduce bias.
- **Double-Blind Trial** – A trial where neither participants nor researchers know who receives the treatment to prevent bias.
- **Placebo-Controlled Trial** – A study where one group receives a placebo to compare results.
- **Bias** – Factors that can influence trial results, leading to incorrect conclusions.
- **Statistical Significance** – A measure of whether observed differences in a study are likely due to chance.
- **Experimental Error** – Mistakes or variations in data collection that can affect the validity of results.