

## Center for Creative Cognition

### **Paper-I: Research Methodology**

Research and Types of research: Meaning of Research- Objectives of Research- Motivation in Research. Research methods vs Methodology. Types of research – Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical. Research Process. Criteria of good Research. Research Formulation – Defining and formulating the research problem - Selecting the problem - Necessity of defining the problem - Importance of literature review in defining a problem – Literature review – Primary and secondary sources – reviews, treatise, monographs-patents – web as a source – searching the web - Critical literature review – Identifying gap areas from literature review - Development of working hypothesis. Data Collection and analysis: Execution of the research - Observation and Collection of data - Methods of data collection – Modeling, Mathematical Models for research, Sampling Methods- Data processing and Analysis strategies. Data Analysis with Statistical Packages – Hypothesis-testing, Generalization-and Interpretation

### **Paper – II: Cognitive Psychology**

#### **Brain and Neuron**

Neuron - structure and function, Nervous system, Structure and function of different brain regions (Occipital, parietal, temporal, frontal lobes, Broca's area, Visual cortex, Hippocampus, Amygdala, etc).

#### **Attention, perception, and memory**

Types of attention (Covert, Overt), Selective attention, Theories of attention, sensation, perception, attentional blink, types of memory (long-term, short-term, declarative, procedural, iconic, etc), Knowledge representation, Recall, Recognition, Serial memory, Visual search, Top-down and bottom-up processing. Neuropsychological disorders related to attention, perception, and memory. Theories of attention and perception (Feature integration theory, Gestalt principles, etc.)

## **Decision making, problem solving**

Logic, Different types of reasoning – Deductive, Inductive, Abductive; Cognitive biases, Problem solving – algorithms and heuristics, Problem solving strategies. Neural basis of decision making

## **General Psychology**

Origin, Nature, Scope and significance, Early pioneers, Contemporary perspectives and domains of psychology, Research methods in psychology, Overview of personality, Trait theories, Psychoanalytic theory, Humanistic theories and behavioral and social learning perspective, Emotions, Personality and EQ, Models of EI

## **Empirical Methods in Cognitive Psychology**

Behavioral studies, Signal detection theory, Basics of Psychophysics, Qualitative and quantitative methods, Electroencephalography (EEG), Functional Magnetic Resonance Imaging (fMRI), Positron emission tomography (PET), Magnetoencephalography (MEG) and their applications in cognitive psychology.