2. Differentiate: **Attempt <u>any 2</u>**   **2 X2 marks**

2.1 Overt vs covert attention

Overt Attention	Covert Attention
Directing attention by physically moving sensory organs towards a stimulus.	Shifting attention without any observable movement of the sensory organs.
Observable and involves physical movement of eyes, head, or body.	Not directly observable, involves internal shifts in attention.
Turning your head to look at a passing car while crossing the road.	Mentally focusing on a conversation while appearing to be engaged in another task.
Focuses on stimuli within the sensory field.	Can be directed towards stimuli within or outside the sensory field.
Generally faster, but can be conspicuous and draw attention.	More subtle and less disruptive, but may require more cognitive effort.

2.2 Gradient model vs spotlight model of attention

Gradient Model of Attention	Spotlight Model of Attention
Represents attention as a gradient that smoothly varies across space.	Represents attention as a spotlight that can be directed to specific areas.
Describes attention as a distributed resource that can be flexibly allocated.	Views attention as a focused beam that illuminates specific regions of space.
Emphasizes the flexibility and dynamic nature of attentional allocation.	Emphasizes the limited capacity and selectivity of attentional focus.
Allows for the allocation of attentional resources to multiple locations simultaneously.	Emphasizes the serial deployment of attention to specific locations.
Can be applied to situations where attention is spread across a wide field, such as driving or visual search tasks.	Useful for understanding focused attention in tasks like reading or searching for a specific object in a cluttered scene.

2.3 Intracellular vs extracellular recording

Intracellular Recording	Extracellular Recording
Electrode is inserted directly into the cytoplasm of a neuron.	Electrode is placed near the neuron, not penetrating the cell membrane.
Provides high-resolution recordings of individual neuron activity, capturing membrane potential changes.	Records the summed activity of multiple nearby neurons, providing lower resolution compared to intracellular recording.
Allows for the direct measurement of membrane potential changes, action potentials, and synaptic potentials.	Provides information about action potentials and population activity but lacks details about individual neuron dynamics.
Highly precise and sensitive to subtle changes in membrane potential, suitable for studying detailed neuronal processes.	Less precise compared to intracellular recording due to the recording of signals from multiple neurons and lack of direct access to membrane potential.
Commonly used in research settings for studying neuronal physiology, synaptic transmission, and membrane properties.	Widely used in neuroscience research for studying population activity, neural coding, and information processing in neural networks.

2.4 Endogenous vs Exogenous attention

Endogenous Attention	Exogenous Attention
Internally driven, voluntary allocation of attention based on goals, expectations, or top-down processes.	Stimulus-driven, involuntary allocation of attention triggered by salient or unexpected external events.
Under conscious control and influenced by higher cognitive processes such as intentions, expectations, and goals.	Less under conscious control and more influenced by bottom-up sensory inputs.
Directed towards specific goals, objects, or tasks based on internal priorities or expectations.	Quickly shifts to capture salient stimuli in the environment, often in a reflexive manner.
Can be sustained over time and maintained on task-relevant information for extended periods.	Brief and transient, as attention rapidly shifts from one salient stimulus to another.
Focusing on reading a book, searching for a specific item in a cluttered environment based on prior knowledge or goals.	Automatically orienting towards a sudden loud noise, responding to a sudden movement in the peripheral vision.

3. Define: **Attempt <u>any 2</u> (50-70 words)**   **2 X2 marks**

   3.1 Zoom lens hypothesis

      The Zoom Lens Hypothesis proposes that human cognition can operate at different levels of granularity or abstraction depending on the context and the goals of the individual. The hypothesis was introduced by psychologist Daniel M. Wegner and his colleagues in the early 1990s.
The "zoom lens" analogy suggests that people can mentally zoom in to focus on fine details or zoom out to see the big picture, much like adjusting the focal length of a camera lens. In other words, individuals can shift their attention and cognitive processing between detailed, specific aspects of a situation and broader, more general aspects.

   3.2 Posner task
      Posner task is a classic experimental paradigm used in cognitive psychology to study the mechanisms of attention. It was developed by Michael I. Posner and colleagues in the early 1980s.
The task involves presenting participants with a central cue, typically an arrow or another visual cue, followed by the presentation of a target stimulus at a particular location on the screen. Participants are required to respond to the target stimulus as quickly and accurately as possible. The key feature of the Posner task is the manipulation of the cue's validity.
Explain cue validity
The participants' reaction times and accuracy rates determine how the validity of the cue influences their attentional processes and response times. The Posner task allows researchers to investigate various aspects of attentional orienting, including the speed and efficiency of attentional shifts, the effects of cue validity on attentional allocation, and the neural mechanisms underlying attentional control.

   3.3 Signal detection theory
      Signal detection theory (SDT) is a framework used to analyze decision-making in the context of uncertainty and noise. It was initially developed within the field of psychophysics to study the ability of individuals to differentiate between meaningful signals and random background noise.

      Signal and Noise: In any decision-making scenario, there are two fundamental components: the presence of a signal (such as a stimulus or event of interest) and background noise (irrelevant or distracting information).
Detection Criterion: SDT proposes that individuals have a criterion or threshold for making decisions about the presence or absence of a signal.
Four Possible Outcomes: In signal detection theory, there are four possible outcomes of a decision:
<p align="center">Hit, Miss, False Alarm, Correct Rejection</p>
Sensitivity: Sensitivity refers to an individual's ability to discriminate between the presence and absence of a signal in the presence of noise.
Response Bias: Response bias refers to the tendency of an individual to be more liberal or conservative in responding to the presence of a signal.

3.4 Serial self terminating search

Serial self-terminating search is used to describe a particular strategy that individuals employ when searching for a target item among distractors.

Serial Processing: starting from one location and moving to the next until they find the target item or exhaust the search area.

Self-Terminating: There's no need to continue searching once the target is identified.

Serial Exhaustive Search: In serial exhaustive search, individuals systematically examine each item in the display, even after finding the target. This process ensures that all items are inspected before concluding the search.

Serial self-terminating search is often observed in situations where the target item can be easily distinguished from the distractors based on one or a few simple features, such as color, shape, or orientation. Once the target is located, there's no need to continue scanning the display.