**Assignment Answers**

## Question 1: Discuss potential functions of axons with multiple boutons en passant. F

Answer: Axons with multiple boutons en passant may serve to (1) disseminate information to several adjacent cells, and (2) enhance synchronous activation within a particular neuronal circuit, improving efficiency and fidelity of the signal cascade.

**Assignment Answers**

## Question 2: Cite two instances of behavior patterns that cannot be accurately portray

Answer: Intrinsic behaviors such as (1) exploratory behavior and decision-making, and (2) complex emotional reactions, like anxiety and depression, cannot be accurately portrayed by the reflex model which fundamentally treats behavior as simple responses to specific stimuli.

**Assignment Answers**

## Question 3: Define the issue of 'axons-of-passage' that arise when implementing stai

Answer: 'Axons-of-passage' are axons that pass through the area of interest but do not form synapses there. This creates difficulties when implementing stains for axon degeneration, as these axons can be stained, muddying the results. Retrograde tracers can potentially resolve this issue as they are taken up by terminal boutons, and thus exclude dystrophic axons-of-passage.

**Assignment Answers**

## Question 4: Conduct internet research to identify a primitive chordate that is more ev

Answer: The primitive chordate, 'Haikouella', found in fossil state in China, exhibits features more primitive than those of lampreys and hagfish, but more advanced than amphioxus. Notably, Haikouella has a heart and eyes, which are absent in amphioxus, but lacks the skull and cranium found in lampreys and hagfish.

**Assignment Answers**

## Question 5: Utilize web resources to research information regarding the brains of cyn

Answer: Research on fossil skulls of cynodonts suggests that they possessed a significantly larger cerebrum compared to their reptilian ancestors, suggesting advanced behavioral capacities. Virtual imprints of their brain cases further hint at the presence of a neocortex, a structure primarily associated with mammals.

**Assignment Answers**

## Question 6: Provide a description of the three key expansions of the vertebrate foreb

Answer: The three key expansions of the vertebrate forebrain are: (1) the development of the telencephalon, notably the presence of a rudimentary cerebral cortex, (2) the expansion of the diencephalon predominantly due to the thalamic complex, and (3) the extension of the preoptic area and subsequent differentiation of the hypothalamus incorporating neuroendocrine functions.