NAME ____

ROLL _____

This quiz has 1 page/s. Write your answer clearly in the spaces provided and on any last blank page. Do not attach rough work. Use the marks alongside each question for time management. Provide 1–2 sentences of informal justification to qualify for partial credit in case your final answer is wrong. You can use the FWH book and your own class notes only.

1. Write down exactly what will be printed by the following code executed by an applicative order Scheme interpreter.

2. We wish to enhance the imperative flavor of FLK! by adding a looping construct (apart from new, read and write):

 $E := \dots | (loop \mathbb{N} E) | (loop E) | (break \mathbb{N} E) | (break E)$

N is an optional label given to a loop. (loop N E) and (loop E) evaluate E repeatedly forever. (break E) ends the nearest lexically enclosing loop with the value of E. (break N E) breaks the nearest lexically enclosing loop labeled N, returning with the value of E.

(a) Write an iterative factorial function using these constructs together with new, read and write.

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(b) Give standard (denotational) semantics (i.e., \mathcal{E} with a continuation parameter) for these new loop/break constructs. (You can ignore the "store" parameter required for the new, read and write constructs, and you need not write \mathcal{E} for the store-accessing constructs.)



Total: 6