Name: ANSWER KEY

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
Actuarial Science Program
DEPARTMENT OF MATHEMATICS

Math 370 (Z) Prof. Rick Gorvett
Exam 2/FM Preparation Fall 2007

Rates of Return and Reinvestment Rates
Summary Quiz

(1) You deposit \$1,000 today into an account that pays you an annual dividend of 8% at the end of each year, in perpetuity. Immediately upon receipt, you deposit each dividend payment into an account earning 5% effective annually. What is the balance in your account after 10 years?

(A) 956 (B) 1,006 (C) 1,056 (D) 2,006 (E) 2,056

$80 \cdot s_{\overline{10}|.05} = 1,006.23$

(2) You deposit \$1,000 into Account A at the end of each year, for the next 10 years. At the end of each year, you withdraw the interest earned in Account A during that year, and deposit it into Account B. Account A earns an effective annual rate of 10%; Account B earns an effective annual rate of 5%. Find the accumulated amount in Account B 10 years from now (including the deposit into Account B that occurs at time 10).

(A) 5,150 (B) 5,250 (C) 5,350 (D) 5,450 (E) 5,550

$P = Q = 100$, $n = 9$ $\quad A(10) = 100(Is)_{\overline{9}|.05} = 5,155.79$

(3) On January 1, 2007, you deposit \$100 into an account. On May 1, 2007, you withdraw \$30. On December 31, 2007, your account is worth \$80. Find the dollar-weighted return on your account during 2007.

(A) 5.0% (B) 7.5% (C) 10.0% (D) 12.5% (E) 15.0%

$$\frac{80 + 30 - 100}{100(1) - 30(2/3)} = \frac{10}{80} = .125$$

(4) On January 1, 2007, you deposit X into an account. On September 1, 2007, your account is worth \$50, and you deposit another \$30 into the account. On December 31, 2007, your account is worth \$100. Your time-weighted return during 2007 was 25%. Calculate X.

(A) 20 (B) 30 (C) 40 (D) 50 (E) 60

$$\left(\frac{50}{X}\right)\left(\frac{100}{80}\right) = 1.25 \Rightarrow X = 50$$