

1. In the town of Green Meadow, two friends, Mr. Allen and Mr. Smith, are in a financial arrangement. Mr. Smith wishes to invest in his hardware store, and Mr. Allen has agreed to lend him a certain amount (S) at an annual interest rate ($r\%$) for 2 years. However, a misunderstanding arises between them. Mr. Smith believes that simple interest is applicable to the loan, while Mr. Allen insists on compound (effective) interest. This misunderstanding leads to a discrepancy of \$3,000 in their estimates of the final repayment amount. If the same loan were to be extended to 3 years instead of 2, the disagreement would result in a difference of \$8,000. Can you calculate the original loan amount (S) and the annual interest rate ($r\%$)?

- A. $S = \$50,000$, $r = 6\%$
- B. $S = \$60,000$, $r = 4\%$
- C. $S = \$45,000$, $r = 8\%$
- D. $S = \$55,000$, $r = 5\%$

Answer: C (8%) (5m)

2. Answer the following questions based on the information given below:

Mr. David Miller, a bakery owner, is scheduled to pay his suppliers an amount of \$8,000 six months from now. However, he has been given an option to pay \$7,600 immediately. If, alternatively, he delays beyond six months, he must pay compound interest of 2% per month on the outstanding amount.

i. What is the commercial (simple) rate of discount that Mr. Miller has been offered?

- A. 4%
- B. 6%
- C. 8%
- D. 10%

Answer: B (6%) (2m)

ii. Assuming the same commercial discount rate, what would be the amount payable two months from now?

- A. \$7,432.32
- B. \$7,560.00
- C. \$7,687.68
- D. None of the above

Answer: A (7,432.32) (2m)

iii. What would be the payment amount if he decided to pay after one year?

- A. \$7,200
- B. \$8,014.08
- C. \$8,142.36

D. \$8,270.64

Answer: D (8,270.64) (2m)

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3. A bond that makes no coupon payments (and thus is initially priced at a deep discount to par value) is called a _____ bond.

- A. Treasury
- B. Floating rate
- C. Junk
- D. Zero-coupon

Answer: D (1.5)

4. Interest rates and bond prices

- A. Move in the same direction.
- B. Move in opposite directions.
- C. Sometimes move in the same direction, sometimes move in opposite directions.
- D. Have no relationship with each other.

Answer: B (1.5)

5. Consider the following hypothetical cash flow:

An investor makes an initial investment of \$500 at the outset. He then receives \$10 every six months for 2 years and a final payment of \$500 at the end of the two year term.

What type of security does the cash flow represent?

- A. Annuity certain
- B. Interest only loan
- C. Fixed interest security
- D. Zero coupon bond

Answer: C (2)

6. Assume that a borrower has a choice between two comparable fixed-rate mortgage loans with the same interest rate, but different mortgage terms, one being a 30-year mortgage and the other a 15-year mortgage. Under financially unconstrained circumstances, which of the following statements best describes the borrowers preference?

- A. The borrower would prefer the 30-year mortgage.
- B. The borrower would prefer the 15-year mortgage.
- C. The borrower would be indifferent between the two mortgages.
- D. The borrower is unable to compare mortgage loans of two different maturities.

Answer: C (2)

7. Which type of mortgage automatically pays off interest and capital?

- A. Repayment
- B. Shared appreciation
- C. Fixed rate
- D. Interest only

Answer: A (1.5)

8. The rate of interest is 4.5% per annum effective. Calculate:

i. the annual effective rate of discount.

- A. 3.972%
- B. 4.125%
- C. 4.3062%
- D. 5.902%

Answer – C (1.5)

ii. the nominal rate of discount per annum convertible monthly

- A. 4.3936%
- B. 4.125%
- C. 4.3062%
- D. 4.549%

Answer – A (2)

iii. the nominal rate of interest per annum convertible quarterly.

- A. 4.125%
- B. 4.3936%
- C. 4.3062%
- D. 4.4260%

Answer – D (2)

9. How many days does one need to hold a 364 days Government Bond redeemable at INR100 if he buys at INR96.5 and sells at INR98.0 after achieving a return of 4% per annum effective. Select the correct option from the choices provided below (workings are not required to be provided).

- A. 182 days
- B. 144 days
- C. 156 days
- D. 142 days

Answer : B (2m)

$$\text{Return earned} = 98/96.5 - 1 = 1.55\%$$

We note that: $(1+4\%)^{(144/365)} = 1.55\%$. Therefore, Option B.

10. A 91-day treasury bill was purchased for INR 103 at the time of issue and later sold to another investor for INR 104 who held the bill to maturity. The bill was redeemable at INR 105. The rate of return

received by the initial purchaser was 5% p.a. effective. Choose which option shows the length of time for which the initial purchaser held the bill.

a) 45 days

b) 72 days

c) 55 days

d) 60 days

Answer – B (3m)

Number of days the bill is held by the first purchaser = t

$$103 \times (1.05)^t = 104$$

$$t = \log 1.009709 / \log 1.05 = 0.198$$

Converted to days, this is $0.198 \times 365 = 72.2809$ or 72 days