Multiple-choice section – choose the correct answer

Question 1 [13.1]

$6000 was invested for 2 years at a simple interest rate of 8% p.a., and then the original amount plus interest was reinvested for another 2 years at a simple interest rate of 10% p.a. The total amount of interest earned in this time is:

A $2352 B $2160 C $1392 D $960

Question 2 [13.1]

The annual rate of simple interest, expressed as a percentage, if an investment of $x increases to $y in  months is:

A  B  C  D 

Question 3 [13.2]

The interest accrued on a loan of $5800 at 8% p.a. compounded twice a year over 2 years, to the nearest dollar, is:

A $1160 B $1231 C $1257 D $2722

Question 4 [13.2]

Inflation will increase the price of a $400 bicycle. The inflated price can be found using compound interest. If the inflation rate is 5% p.a., in 2 years’ time the bicycle will cost, to the nearest dollar:

A $405 B $420 C $440 D $441

Question 5 [13.3]

The cost of a novel today is $30. The cost of a similar novel 10 years ago, assuming an inflation rate of 2.4% p.a. was:

A $30(0.976)10 B $ C $30(1.024)10 D $

Question 6 [13.4]

The effective interest rate on a loan for 4 years at 7.2% p.a. compounded daily is:

A 7.39% B 7.46% C 7.48% D 8.34%

Question 7 [13.6]

The population of a colony of 400 koalas declined at a rate of 6% p.a. for 10 years due to disease. The remaining koalas were transferred to a park, where their numbers increased by 7.1% p.a. The number of years it will take for the population to exceed 400 is closest to:

A 2 years B 5 years C 7 years D 10 years

Question 8 [13.4]

Wayne and Garth both invest $P for T years. Wayne’s investment compounds at R% per annum and Garth’s investment pays simple interest at the rate of R. The extra amount of interest that Wayne’s investment made over T years is:

A  B 

C  D 

Question 9 [13.5]

$1200 depreciates to $1000 in 5 years due to inflation. Assuming reducing balance depreciation, the annual inflation rate expressed as a percentage is:

A  B  C  D 

Multiple-choice results: \_\_\_ / 9

Short answer section

Question 10 10 marks [13.1– 13.5]

Use words from the list below to complete the following sentences.

interest adjusted value compound interest depreciation

principal straight-line depreciation written-down value

(a) The original amount of money loaned or invested is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(b) Simple interest depends on the principal, \_\_\_\_\_\_\_\_\_\_\_ rate per annum and the time in years.

(c) The decrease in cost or value is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(d) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ applies when items lose a constant amount of value each year.

(e) The value of an item after it depreciates is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or the \_\_\_\_\_\_\_\_\_\_\_\_\_.

(f) Interest calculated on the principal plus the interest on the previous period is \_\_\_\_\_\_\_\_\_\_\_.

Question 11 4 marks [13.1]

Show how $10 000 invested at 8% p.a. for 2 years can earn different amounts of interest by using the following time periods to compound the interest.  
(a) half-yearly (b) weekly

Question 12 3 marks [13.3]

My coin collection is increasing in value at a rate of 10% p.a. The collection is currently worth $2000. How many years will it take for the collection to increase in value to at least $3000?

Question 13 3 marks [13.1]

A deposit accumulates to $5100 in 9 months. The interest is paid at 9.6% p.a. and compounded quarterly. Calculate the initial deposit to the nearest dollar.

Question 14 3 marks [13.1]

A population of 520 frogs decreases by 1.8% each year. What will the population be after 6 years, to the nearest frog?

Question 15 3 marks [13.1]

What rate of simple interest is needed to increase $10 000 to $11 620 in 3 years, correct to 1 decimal place?

Question 16 3 marks [13.3]

Over 7 years an investment of $9400 compounds to $12 370. Calculate the annual interest rate to the nearest whole percentage.

Question 17 8 marks [13.5]

A car sold for $41 000 will have a scrap value of $2000 in 15 years. Calculate the:

(a) total possible depreciation (assume straight-line depreciation)

(b) unit cost depreciation

(c) depreciation after 3 years

(d) written-down value after 3 years.

Question 18 2 marks [13.6]

A rare species of fish has doubled its population over the last 10 years due to a breeding program. What has been the annual rate of growth, correct to 1 decimal place?

Question 19 6 marks [13.4]

Find the effective rate of interest of an investment initially worth $22 000 if the interest rate of 10.5% is compounded:

(a) monthly (b) daily

Question 20 3 marks [13.1]

What rate of simple interest is needed to triple an amount of money in 10 years?

Question 21 2 marks [13.2]

How much will $4000 be worth if it has been invested for 3 years with an interest rate of 5% p.a., compounding every 3 months?

Short answer results: \_\_\_ / 50

Extended answer section

Question 22 6 marks [13.4]

An art collector buys a rare sculpture for $222.

(a) The art collector keeps the sculpture for 5 years, during which its value increases by an average of 4% each year. Find the value of the sculpture after 5 years, correct to the nearest dollar.

(b) After 5 years, the sculpture sells for $300. How much profit does the art collector make?

(c) Express the profit after 5 years as a percentage increase, correct to 1 decimal place.

Question 23 8 marks [13.4]

Two friends invested $1400 each in different accounts.  
Alice used a simple interest account at 10.1% p.a.  
Beau used an 8.1% compound interest account, compounding annually.

(a) Complete the table to show the amounts their investments were worth at the end of each year. Continue the table until Amount B (Beau) is greater than Amount A (Alice).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Years | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Amount A |  |  |  |  |  |  |  |  |
| Amount B |  |  |  |  |  |  |  |  |

(b) How long will each investment take to double in value?

(i) Alice (ii) Beau

Question 24 12 marks [13.1]

Some early postage rates for letters are given in the table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | 1966 | 1971 | 1976 | 1981 |
| Cost (cents) | 4 | 7 | 18 | 24 |

(a) (i) What was the average annual percentage increase from 1966 to 1971?

(ii) What annual inflation rate between 1966 and 1971 would correspond to the increase in price from 4 to 7 cents?

(b) (i) What was the average annual percentage increase from 1966 to 1976?

(ii) What annual inflation rate between 1966 and 1976 would correspond to the increase in price from 4 to 18 cents?

(c) (i) What was the average annual percentage increase from 1966 to 1981?

(ii) What annual inflation rate between 1966 and 1981 would correspond to the increase in price from 4 to 24 cents?

Extended answer results: \_\_\_ / 26

TOTAL test results: \_\_\_ / 85