Multiple-choice section

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Answer | A | D | C | D | B | B | D | A | B |

Question 1 [13.1]

A

I = 

Interest for first 2 years

= $6000 × 0.08 × 2

= $960

Interest for next 2 years

= $6960 × 0.1 × 2

= $1392

Total interest

= $960 + $1392

= $2352

Question 2 [13.1]

D

Investment increase = 

I = 

 = 

R = 

Question 3 [13.2]

C

A= P(1 + r)n

= 5800(1+ 0.04)5

= 7056.59

I = A – P

= 7056.59 – 5800

= $1257 (nearest dollar)

Question 4 [13.2]

D

A= P(1 + r)n

A = $400(1.05)2

A = $441

Question 5 [13.3]

B

A= P(1 + r)n

$30 = P(1.024)10

P = 

Question 6 [13.4]

B  


Question 7 [13.6]

D

Population first 10 years:

= 400(1 – 0.06)10

= 215.44…

Assume that 215 koalas were transferred to the park.

Population next 10 years

= 215(1.071)10  
= 426.906…

This is the first value over the required 400, so it would take 10 years.

Question 8 [13.4]

A

Interest made by Wayne’s investment:



Interest made by Garth’s investment:



Difference in the interest amounts:



Question 9 [13.5]

B

**

Multiple-choice results: 9

Short answer section

Question 10 10 marks [13.1– 13.5]

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

(b) The simple interest depends on the principal, interest rate per annum and the time in years.

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

(d) Straight-line depreciation applies when items lose a constant amount of value each year.

(e) The amount of an item after it depreciates is called the written-down value or the adjusted value.

(f) Interest that is calculated on the principal and interest from the previous period is compound interest.

Question 11 4 marks [13.1]

(a) A = 10 000(1 +)4 using half-yearly intervals  
= $11 698.59  
I = $1698.59

(b) A = 10 000(1 +)104 using weekly intervals  
= $11 733.67  
I = $1733.67

Question 12 4 marks [13.3]

A = P(1 + r)n

= 2000(1.1)n

Trial and error gives:

2000(1.1)4 = 2928.20 when n = 4

2000(1.1)5 = 3221.02 when n = 5.

∴n = 5

Another solution uses repeated multiplication by 1.1, leading to $2000 × 1.1 × 1.1 × 1.1 × 1.1 × 1.1   
= $3221.02, so it takes 5 years.

Question 13 3 marks [13.1]

A = P(1 + r)n

P = **

P = $4749.77

= $4750 to nearest dollar

Question 14 3 marks [13.1]

A = 520(1 – 0.018)6

= 466.302

There will be 466 frogs.

Question 15 3 marks [13.1]

I = A – P

= 11 620 – 10 000

= $1620

I = 

1620 = 

R = 

= 5.4% p.a.

Question 16 3 marks [13.3]

A = P(1 + r)n

12 370 = 9400(1 + r)7



= 0.04

= 4%

Question 17 8 marks [13.5]

|  |  |
| --- | --- |
| (a) Total possible depreciation = $41 000 – $2000 = $39 000 | (b) Unit cost depreciation =  = $2600 per year |
| (c) Depreciation after 3 years = $2600 × 3 = $7800 | (d) Written-down value after 3 years = $41 000 – $7800 = $33 200 |

Question 18 2 marks [13.6]



Question 19 6 marks [13.4]

(a) monthly  
A = $22 000  
= $24 424.48  
I = $2424.48  
ref =   
= 11.02%

(b) daily  
A = $22 000  
= $24 435.26  
I = $2435.26  
ref = %  
= 11.07%

Question 20 3 marks [13.1]

I = 3P – P = 2P  
I = **  
2P = **  
2 =   
r = %  
 = 20%

Question 21 2 marks [13.2]

A = P(1 + r)n   
= 4000(1 + 0.0125)12   
= $4643.02

Short answer results: 50

Extended answer section

Question 22 6 marks [13.4]

|  |  |  |
| --- | --- | --- |
| (a) A = 222(1.04)5 = $270 (nearest dollar) | (b) Profit = $300 – $270 = $30 | (c) Profit % =   = 13.51... The percentage increase is 13.5%. |

Question 23 8 marks [13.4]

(a)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Years | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Amount A | 1400 | 1541.4 | 1682.8 | 1824.2 | 1965.6 | 2107 | 2248.4 | 2389.8 |
| Amount B | 1400 | 1513.40 | 1635.99 | 1768.50 | 1911.75 | 2066.60 | 2233.99 | 2414.95 |

|  |  |
| --- | --- |
| (b) (i) 1400 = 1400 × 0.101 ×T T =  = 9.9 years It will take 10 years. | (ii) 2800 = 1400(1.081)n 2 = 1.08n By trial and error, 1.0819 = 2.02 It will take 9 years. |

Question 24 12 marks [13.1]

|  |  |  |
| --- | --- | --- |
| (a) (i) Increase = 3 original = 4 Percentage increase = 3 ÷ 4 = 0.75  = 75% Average annual increase % =  = 15%  (ii) r =    = 11.84% | (b) (i) Increase = 14, original = 4 Percentage increase = 14 ÷ 4 = 3.5 = 350% Average annual increase % =  = 35%  (ii) r =   = 16.23% | (c) (i) Increase = 20 original = 4 Percentage increase = 20 ÷ 4 = 5  = 500% Average annual increase % =  = 33.33%  (ii) r =   = 12.69% |

Extended answer total marks: 26

TOTAL test marks: 85