# **Unit 3 Further Mathematics**

**Chapter 6 Interest and Depreciation**

Multiple Choice Section

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|  | | The scouts committee have $1267 in the bank for the whole of January. If the bank pays 5.3% p.a. paid at the end of each month, the amount the club has at the end of January is:  A $5.60  B $67.15  C $1334.15  D $1345.98  E $1272.60 | |
|  | | The price of a TV entertainment system is $3220. The bank offers a personal loan of a single payment to be paid after 3 years. Overall, this will cost the customer $3925. The flat rate of interest per annum would be:  A 9.76%  B 15.96%  C 27.33%  D 7.29%  E 8.20% | |
|  | | What is the difference in money terms between investing  at 10% p.a. for 5 years compounded yearly as compared to compounded monthly? (Give the closest answer.)  A $3000  B $3500  C $4000  D $4500  E $5000 | |
|  | | The number of interest bearing periods for an investment that is compounded quarterly over 5 years is:  A 5  B 60  C 59  D 20  E none of the above | |
|  | | is invested in an account paying a flat rate interest of  p.a. The recurrence relation for the value of the investment after  years is:  A ,  B ,  C ,  D ,  E , | |
|  | | An investment of $1230 was made over  years at an interest rate of 6% p.a. with interest compounding annually.  The interest earned during the second year is:  A $  B $  C $  D $  E | |
| **7** | | A van purchased for  depreciates at a rate of  cents per kilometre. If the van’s scrap value is considered to be , the useful life of the van will be  A  B  km  C  years  D  km  E  km | |
| **8** | | A washing machine costs  to purchase new. It depreciates at a rate of  per year. After  years its future value will be:  A  B  C  D  E | |  | |
| **9** | | The minimum interest rate per annum required for an investment of  to grow to at least  in  years if compounded quarterly would be  A  B  C  D  E | |  | |
| **10** | | A sofa valued at  was purchasedyears ago for . A straight line depreciation model reflecting this situation would have which following equation?  A  B  C  D  E | |  | |

Short Answer Questions

**Question 1**

Mr Tomlinson opened a fixed deposit account in which he invested $525 at 3.25% p.a. simple interest. Mr Tomlinson planned to leave the money there for a full 5 years.

(a) Set up a recurrence relation to find the value of the investment after years.

The amount of interest earned each year is given by 



, hence 

The recurrence relation is given by

, .

(b) Use the recurrence relation from part (a) to find the value of the investment at the end of each year and hence state the value of the investment at the end of the 5-year period.

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The value of the investment after 5 years is .

**Question 2**

After depositing some money in a savings account earning 4.5% p.a. simple interest, Thalia was told that she had accrued $496 in interest after 2 years. What amount had she originally invested?









The amount originally invested by Thalia was $5511.11.

**Question 3**

 is invested for  years at 2.9% p.a. with interest compounded annually.

(a) Establish the compound interest formula for this situation.





The compound interest formula for the given situation is .

(b) Find the amount of interest earned for the total period of  years.

Since  

Interest earned 

**Question 4**

Approximately how long would it take Peter to save up for a $5000 car if he has $3500 now and elects to invest his money at 12% p.a., interest credited monthly?



Use the Finance Solver in CAS to solve for :





It will take Peter approximately  years to save .

**Question 5**

The growth factor for a particular account was given as 1.0016.

(a) Establish the rate of interest per period.



(b) Given that the interest is compounded monthly, state the annual interest rate.

 represents the interest per period. Since the interest is being compounded monthly, the yearly interest rate will be .

(c) Complete the following compound interest table showing the value of the investment for the first six months, based on the above interest rate.

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| Time period |  | Interest |  |
|  |  | of |  |
|  |  | of |  |
|  |  | of |  |
|  |  | of |  |
|  |  | of |  |
|  |  | of |  |

**Question 6**

The cost of a computer was $2399. It depreciates at a rate of 45% p.a.

(a) Calculate the total depreciation after 2 years.







Hence, the computer will be worth  after 2 years. Total depreciation will be 

(b) Generate a depreciation schedule to establish how long it will take for the computer to be worthless, if the computer is considered worthless when less than $100 in value.

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| --- | --- |
| **Time**  **(years)** | **Future value** |
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