|  |  |  |  |
| --- | --- | --- | --- |
| Name:  Teacher : | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | Date:\_\_\_\_\_\_\_\_\_ |
|  | **Year 12 Essentials – Practical Application**  **Loans and Compound Interest - Mark Scheme**  **Weighting 11% Due Date: \_\_\_\_\_\_\_\_\_\_\_\_** | **Mark \_\_\_\_\_\_\_\_\_** | |

Scenario

Can James afford a new car?

James would like to buy a new car that costs $22 990.

He has had $2000 in a term deposit for the last 2 years earning 1.2% p.a. interest compounded quarterly and has been saving 10% of his salary every month for the last 6 months and putting this money in a savings account that earns 0.65%p.a. interest compounded monthly.

He can use this as a deposit, but he will need to borrow the remaining amount.

James takes home $3400 a month.

|  |  |
| --- | --- |
| Description / Working | Marks /42 |
| **Interpret the task and gather the key information**   * Some Introduction * Rewrites the question to be answered   **Identifies Information required**   * Amount from the term deposit * Amount from savings * Research a loan for the car * Research possible loan options for the car | 1  1  1  1  1  1  /6 |
| **Identify the mathematics which could help to complete the task**   * Using compound interest to find the term deposit amount * Using compound interest to find the savings amount * Finding the repayment on a loan * Can the repayments be made on the salary | 1  1  1  1  /4 |
| **Analyse information and apply their existing mathematical knowledge and strategies to obtain a solution**  Term Deposit  Savings   |  |  |  |  | | --- | --- | --- | --- | | Time  (Months) | Start Amount | Interest | Final Amount | | 1 | $340 |  | $340.18 | | 2 | $340.18+340=$680.18 |  | $680.55 | | 3 | $680.55+340=1020.55 |  | 1021.10 | | 4 | 1021.10+340=1361.10 | 0.74 | 1361.84 | | 5 | 1361.84+340=1701.84 |  | 1702.76 | | 6 | 1702.76+340=2042.76 |  | $2043.87 |   Total deposit 2048.51+2043.87=4092.38  22990-4092.38 = 18897.62  Car Loan   * Identify loan amount parameters for one loan * Calculate monthly repayment value   Second loan with changed conditions   * Different interest rate or time period * Monthly payment value | 1 (compound interest formula)  1 (correct values for variables)  1(correct answer)  1 ($340 start amount)  1 (Correct interest Formula)  1 (Final amount first Month)  5(Correct for each month)  1  1 (accept rounded values)  2  2  1  2  /20 |
| **Verify the reasonableness of the solution**   * Answers correctly rounded to 2 decimal places for money * Identifies other costs involved with owning a car * Calculates other costs * Calculates monthly cost for a car * Identifies other bills/costs that will need to be considered – How much of his salary could he use? | 2  1  1  2  2  /8 |
| **Communicate findings in a systematic and concise manner**   * Conclusion * Answers the original question * Report set out logically * Reference section included | 1  1  1  1  /4 |