

## **SAMPLE CASE STUDY for FPAM website.**

### **SETTING THE STAGE:**

Norliah has come to see you at the urging of her best friend Melanie Chong. Melanie is a long-time satisfied customer of your fee- and commission-based financial planning practice.

Norliah is 34, happily single, and earns a gross salary of RM12,000 a month as the assistant creative director of a leading KL-based advertising firm. She is immensely cosmopolitan and loves to spend her semi-annual vacations either in the US or the UK. In fact, since she was born on January 1<sup>st</sup> 1968, she spent the exciting eve of her 32<sup>nd</sup> birthday dancing with other revellers at a hip London club. In addition to being chic and sophisticated, Norliah is immensely good at her job. So much so, her appreciative boss has told her she will receive a raise of RM3,000 a month, starting next month!

In an excited conversation with her best friend Melanie, Norliah discussed how she planned to lavishly spend her way through her impending RM15,000 a month gross salary. But halfway through that exchange, Norliah let slip that she was a little apprehensive about her financial future.

Melanie seized the chance to recommend your excellent professional services in the area of holistic financial planning for Malaysians.

Two days later, Norliah walked through the door of your office for the very first time. Her striking looks complemented her elegant (undeniably expensive) taste in clothes and perfume.

Norliah ostensibly acts like there is no tomorrow! She lives in an upmarket condominium surrounded by expatriate neighbours who earn more than she does, yet who, mostly, spend less!

She has no steady boyfriend, but seems more than satisfied with her lengthy string of well-heeled admirers. Norliah drives a one-year old foreign model that cost her RM180,000 when she bought it brand new, last year. It can now fetch just RM145,000 on the open market. When Norliah bought the car, she put down RM30,000 and borrowed RM150,000 from a finance company. Her hire purchase loan has a total tenure of 7 years, and the quoted interest rate is 6% per annum (p.a.). Recently, an even flashier model has caught her eye and she is beginning to contemplate selling off her present car.

After that initial hour-long discussion, you also learnt that Norliah has no life insurance, very little in savings and believes in maintaining a rolling balance on her gold Visa. She currently owes RM23,000 on it. In a typical month, she pays off about 20% of what she owes on her card.

In subsequent meetings, you learn these other key characteristics of her life:

1. You discover that Norliah's father Ahmad is an extremely religious Muslim who lives in Kelantan. He frowns upon his daughter's lifestyle and choice of friends.
2. Exactly two years ago, Norliah borrowed RM400,000 to help pay for her upmarket condo. At the time, the base lending rate was 6.8%, and as such she paid RM3,371 per month on her 20-year mortgage. Precisely three months ago, the BLR of her bank was reduced to 6.4%. Her loan costs BLR + 1.3%. Even with the 40-basis point reduction in interest rate cost, Norliah continues to pay RM3,371 per month toward that loan. You compliment her on her foresight in doing so, but the quizzical look she gives you in return indicates Norliah does not truly understand the long-term impact of her wise choice. (Make sure you explain matters to her, briefly, in your answer to question 2(a).)
3. Norliah has RM5,000 in her current account and RM2,000 in a fixed deposit account. Her EPF balance is RM200,000. Because she has never made any EPF withdrawals, Norliah is under the mistaken belief that EPF will provide sufficient funds for her retirement. She plans to retire at 55.
4. Norliah has no Will but intends to write one soon, leaving all her worldly possessions to her friends and nothing to her numerous relatives who have shown nothing but disdain for her chosen way of life.

*That brief summary sets the stage for the construction of Norliah's financial plan. The following questions raise issues that need to be considered – sometimes in modular fashion, and at other times as part of a greater whole.*

**UNDERSTAND THIS:** *In financial planning, there is seldom just ONE right answer. So, those that follow are workable, but not exclusively correct, solutions.*

**[Additional assumptions you may choose to make as simplifying aids to your analysis:**

- 1. Norliah is charged the nominal interest rate of 1.5% a month on her credit card balance. All her fresh charges are raked up at the start of the month, and she makes her payments at the end of the month.**
- 2. Norliah's credit card issuer insists on a minimum monthly credit card payment of 5% of the previous month's closing balance, subject to a RM50 minimum payment unless the total balance falls below RM50. If that happens, the entire sum must be paid in full.**
- 3. Norliah's bank DOES NOT charge a penalty for increases in mortgage repayments. Also, her well structured mortgage grants immediate clearance since it calculates interest owed on a daily rest basis.**
- 4. Norliah does not pay SOCSO. The only deductions at source on her gross salary are for tax, based on the Inland Revenue Board's (LHDN's) schedule of monthly deductions, and 11% of gross salary for employee's EPF. Norliah's company pays 12% of gross salary for employer's EPF.**
- 5. Prior to meeting you for the first time, Norliah had been spending – for the preceding 12 months – an average of RM1,000 a month MORE than her net**

take-home pay. That over-expenditure is a key contributor to her large rolling credit card balance. A month after meeting you for the first time, her anticipated RM3,000 increase in gross salary goes through. Remember to account for the RM1,000 in fresh monthly credit card charges, which forms part of her total spending pattern. So too does all accruing interest from all known liabilities. **FOR SIMPLICITY'S SAKE, YOU MAY ASSUME THAT ALL FRESH CHARGES ARE CHALKED UP ON THE VERY FIRST DAY OF EACH BILLING PERIOD.** Also, assume that her credit card account charges interest immediately on all new charges, if there is any unpaid amount from the previous billing period.

6. Long-term rates of return for well-chosen direct stock investments can be assumed to range from 10% to 15%, with tremendous short- and medium-term volatility. Long-term rates of return for equity unit trusts can be assumed to be 12% p.a. BEFORE average annual expenses of 1.5%; to simplify calculations here, ignore the front-end load – however, be aware that the impact of loads must be taken into account in real life client situations. Assume bond funds yield 8% p.a. before average annual expenses of 0.75%; again, ignore the impact of possible loads. Assume FD rates average 5% over the next 20 years.]
7. You may assume a long-term future annual dividend rate of 5.5% from the Malaysian EPF. For projection purposes, use 4% p.a. for inflation.
8. Should the need arise for you to project future life expectancy, use the following mortality table (suggestion: round off the anticipated lifespan to the nearest whole year for ease of calculation). However, since the figures are indicative of average ages, you would be wise to then add on 10 years to dramatically reduce the possibility of your client outliving her money! (Note: If you build a retirement funding plan based purely upon the average lifespan, by definition your client has a 50% chance of outliving that plan.)

## MALAYSIAN LIFE EXPECTANCIES

AGE	MALE	FEMALE
18	75.65	81.45
19	75.71	81.46
20	75.77	81.48
21	75.84	81.50
22	75.92	81.52
23	76.00	81.54
24	76.08	81.57
25	76.16	81.59
26	76.23	81.62
27	76.29	81.65
28	76.35	81.68
29	76.41	81.71
30	76.46	81.74
31	76.50	81.78
32	76.55	81.81
33	76.59	81.85
34	76.63	81.89
35	76.68	81.92
36	76.72	81.96
37	76.77	82.01
38	76.82	82.05
39	76.87	82.09
40	76.93	82.13
41	76.99	82.17
42	77.05	82.22
43	77.12	82.26
44	77.20	82.31
45	77.28	82.36
46	77.37	82.41
47	77.47	82.47
48	77.58	82.52
49	77.70	82.58
50	77.83	82.65
51	77.96	82.71
52	78.11	82.78
53	78.26	82.85
54	78.43	82.94
55	78.61	83.04
56	78.80	83.16
57	79.00	83.28
58	79.21	83.42
59	79.43	83.58
60	79.66	83.74
61	79.89	83.92
62	80.14	84.10
63	80.39	84.30
64	80.66	84.50
65	80.95	84.70
66	81.25	84.91
67	81.56	85.12
68	81.90	85.35
69	82.25	85.61
70	82.62	85.88
71	83.01	86.19
72	83.41	86.51
73	83.84	86.86
74	84.28	87.22
75	84.74	87.60

[Source: *Financial Freedom – Your Guide to Lifetime Financial Planning*, pg. 313, Appendix C, Edmond Cheah, Wong Boon Choy, Alex Sito and Rajen Devadason, (Public Mutual Bhd, 1998); Insurance Regulation Department, Bank Negara Malaysia (March 12<sup>th</sup> 1992)]

## QUESTIONS:

1. Explain to Norliah what you can and cannot do for her in your role as financial planner. Tailor your answer to encompass the following issues:
  - a. In your very first session with her, Norliah tells you that quite apart from the impending RM3,000 pay rise, her boss has promised her a fixed entertainment allowance of RM2,000, to compensate her for the RM24,000 she expects to spend (unevenly) in the coming year wining and dining potential clients. Give her one alternative suggestion pertaining to that promised fixed allowance that will reduce her potential taxable income.
  - b. Using this simple piece of advice as a ‘trust earner’, you then launch into an explanation of the need to delineate between your responsibility to her as a planner holding the coveted CFP mark, and her responsibility to act as an intelligent, prudent client. In that answer, touch upon the Financial Planning Association of Malaysia’s Code of Ethics and Professional Responsibility – *an extensive answer is not required, but do quote verbatim Rule 201, Rule 202, Rule 401 and Rule 408*. Extensive reference may be made to pertinent information found at [www.fpam.org.my](http://www.fpam.org.my) or in the FPAM-published booklet entitled:

### **CODE OF ETHICS AND PROFESSIONAL RESPONSIBILITY DISCIPLINARY RULES AND PROCEDURES FINANCIAL PLANNING PRACTICE STANDARDS**

2. Briefly, and in purely qualitative terms, describe ‘amortisation’. Your answer should focus on the conventional amortisation process itself and the effect it has on interest and principal repayments at the start and end of a loan period.
  - a. Then, work out two basic amortisation tables – one showing the pertinent annual details of Norliah’s mortgage under the older, higher interest rate regime, and another showing details under the newer, lower interest rate regime. Show all your workings clearly, preferably using a spreadsheet, and calculate how much faster she will end up repaying her mortgage through her surprisingly wise decision to maintain her monthly mortgage payment quantum, and how much interest she saves. (Assume, for simplicity, that Norliah chooses NOT to use money from her EPF Account 2 to make principal reductions every three years. In real life situations, however, utilising that EPF withdrawal option would generally be an excellent course of action.)
  - b. ASSUMING THE NOMINAL MONTHLY INTEREST RATE CHARGED IS 1.5%, work out how long Norliah would take to pay off her entire credit card balance if she adds RM1,000 a month in charges in the first 12 months of working with you, and makes her partial 20% of outstanding balance payments at the end of each month. Also, work out the total interest paid, the total principal paid, and the ratio between total

interest to total principal. (Assume that after the first year of using your excellent services, she stops adding fresh charges to her credit card.)

- c. Use all the information garnered in parts 2(a) and 2(b) to explain to Norliah the concept of the ‘time value of money’.
  - d. Based on all you know about her now, construct a simple Net Worth statement AND a simple Cashflow statement taking into account your perception of where she is TODAY. Then, construct an ‘ideal’ Cashflow statement for Norliah to replace the current one. (Use her current gross salary of RM12,000 per month, and assume that 40% of her net take-home pay is spent on miscellaneous items not touched upon explicitly in the scenario; in-depth querying on your part leads you to conclude that 50% of that two-fifths of portion is sheer wastage that doesn’t really add to Norliah’s quality of life). Outline a series of steps to improve her situation that will move her from the current Cashflow situation to the ideal one. Then construct one Net Worth statement showing her anticipated position one year from now, if she does nothing, and another Net Worth statement for the same timeframe, one year out, that reflects Norliah’s adherence to your advice based upon the ‘ideal’ Cashflow statement.
3. Since Norliah tends to live ‘like there is no tomorrow’, carefully and gently explain to her the meaning of this guiding principle: **The key to reaching financial freedom is to focus on strengthening your net worth statement.** Focus on giving her advice on how best to get out of debt – touching on two workable strategies – and, eventually, channel freed cashflow into a series of appropriate investments. Explain which of the two methodologies you will use and why. Do so briefly, without going into excessive detail.
4. Studies have shown that educators such as teachers and lecturers often make extraordinarily good financial planners. This is due to the educational cum counselling skills needed to ‘manage’ clients’ expectations and to mentor them. You rely greatly upon such innate skills yourself.
- a. Toward that end, in the midst of regular client reviews with Norliah, you make mention of the Rule of 72 and the Rule of 78, in very different contexts.  
The Rule of 72 pops up when you’re discussing investment returns and inflation erosion.  
You explain the Rule of 78 to Norliah when pointing out the differing effects of her potential decision to sell her car, depending on when she does so. She is contemplating selling it immediately at the start of Year 2 of her HP loan, or a year down the road at the start of Year 3 of her HP loan, or four years from now at the start of Year 6 of her HP loan. Then, work out the APR (annualised percentage rate) of that full 7-year loan – assuming she keeps the car for the full duration of the loan – and explain in qualitative terms only the difference between the official quoted interest rate of 6% p.a. and the calculated APR. Imagine you are having this wide-ranging discussion with Norliah in your office. Elaborate upon the two key uses of the Rule of 72 already mentioned,

and then outline the reason the Rule of 78 is used in situations where simple interest rather than compound interest is utilised in principal and interest calculations.

b. Assume that within just 6 years of working as her financial planner you succeed in guiding Norliah to a position of complete freedom from debt. On her 40<sup>th</sup> birthday, Norliah is still contentedly single. At this time you initiate an aggressive programme of retirement funding that is targeted to complement her EPF savings. Also, note that in the midst of helping her clean up the liability portion of her net worth statement, you raise her cash reserves up to RM100,000. By this time, Norliah's job position is extremely secure, and her monthly expenses are RM10,000 a month. You decide that a three-month emergency buffer is sufficient for her. (Explain the instruments used as buffer repositories – you may make use of the phrase 'return of capital NOT return on capital' in your explanation of choice of asset class or asset vehicle.) Once you have done that, you may ignore the effects of inflation and all subsequent pay increases over the following 15-year period, and assume that Norliah begins her new retirement funding programme IMMEDIATELY (at age 40, in 2008) using as an initial lump sum all of her cash reserves **minus** the buffer amount. By this time, January 1<sup>st</sup> 2008, her monthly cashflow surplus has risen to **RM12,000**. You advise her to utilise a fixed sum of something between 50% and 90% **of that monthly surplus** to add to her new retirement funding programme at the end of each month. If you work out that Norliah requires RM7.8 million to be able to retire comfortably at age 55 when, incidentally, her EPF balance will be RM4.5 million (which assumes no intervening withdrawals):

- i. How much should she invest each month, assuming an 8% nominal annual growth on her portfolio to make up the shortfall from EPF?
- ii. If Norliah invests 60% of her surplus each month, what nominal annual growth rate must she earn to achieve her goal?
- iii. What if she invests only 30% of her surplus, what nominal annual growth rate must she earn to achieve the same goal?

Since Norliah invests her money 12 times a year, work out the effective interest rate or annualised percentage rate (APR) for each of those **three** nominal rates. Put on your educator hat again to first state what the common acronym IRR stands for. Then, explain and define IRR, based on the specified inflows of cash into the portfolio from the beginning of 2008 until the end of 2022, and the targeted cash outflow on January 1<sup>st</sup> 2023. Explain the danger of over-reaching for yield in such a situation – use the following terms – risk, volatility, standard deviation, the Sharpe ratio and beta – in your answer.

c. Relate your explanation to the need for a blending of asset classes to construct an appropriate portfolio, as a cornerstone of your investment planning approach for Norliah. In your explanation, touch lightly upon each of the following terms: diversification, dollar-cost averaging,

portfolio optimisation, the efficient frontier, alpha and correlation. Also, elaborate briefly upon the assertion: **SYSTEMATIC RISK IS NON-DIVERSIFIABLE**. Then, for EACH of the 30% and 60% of surplus cash scenarios, suggest one appropriate portfolio. Make sure you use the assumptions in ‘additional assumption 6’.

5. Since Norliah is a Muslim, the issue of FARAID is relevant to her circumstances.
    - a. Briefly define what FARAID means – you need only touch upon the subject in conceptual terms; there is no need to go into an excessive analysis of its application. However, to help illustrate your conceptual answer you may consider this hypothetical scenario: Norliah writes a Will and specifies that her Buddhist friend Melanie Chong is to inherit Norliah’s car. Melanie doesn’t really need another vehicle, but she is deeply touched that Norliah thought enough about their relationship to bequeath something so substantial to her. But, quite predictably, Norliah’s father Ahmad disputes that clause of Norliah’s Will! What happens to Norliah’s bequest?
    - b. Under Syariah law, only a portion of a deceased Muslim’s estate may be disposed of through a Will. What is that portion, in fractional terms? Under what specific circumstances may that proportion rise above that fractional ceiling? What does this mean in regard to Norliah’s wish to exclude her relatives from inheriting anything from her?
    - c. There are 12 relatives entitled to Syariah distribution of the remainder of a Muslim’s estate NOT ALREADY distributed in line with the dictates of a legally established, uncontested Will. Name them. Then, discuss the issue that relates to the preferential position of three out of 15 possible categories of male heirs. Also, discuss the preferential position of five out of 10 possible categories of female heirs. (THIS IS AN EXTREMELY COMPLEX DISTRIBUTION ISSUE, SO STAY FOCUSED ON ONLY ANSWERING THE QUESTIONS ASKED.)
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**SAMPLE ANSWERS TO ALL QUESTIONS:**

Q1. Explain to Norliah what you can and cannot do for her in your role as financial planner. Tailor your answer to encompass the following issues:

- e. In your very first session with her, Norliah tells you that quite apart from the impending RM3,000 pay rise, her boss has promised her a fixed entertainment allowance of RM2,000, to compensate her for the RM24,000 she expects to spend (unevenly) in the coming year wining and dining potential clients. Give her one alternative suggestion pertaining to that promised fixed allowance that will reduce her potential taxable income.
- f. Using this simple piece of advice as a ‘trust earner’, you then launch into an explanation of the need to delineate between your responsibility to her as a planner holding the coveted CFP mark, and her responsibility to act as an intelligent, prudent client. In that answer, touch upon the Financial Planning Association of Malaysia’s Code of Ethics and Professional Responsibility – *an extensive answer is not required, but do quote verbatim Rule 201, Rule 202, Rule 401 and Rule 408*. Extensive reference may be made to pertinent information found at [www.fpam.org.my](http://www.fpam.org.my) or in the FPAM-published booklet entitled:

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**SAMPLE ANSWER TO Q1.**

Since financial planning is defined by the Certified Financial Planner (CFP) Board of Standards as: ‘... the process of meeting your life goals through the proper management of your finances,’ it is clear that my role as Norliah’s financial planner encompasses the responsibility of helping her reach her life goals by showing her how to manage her finances well.

This means that my primary professional obligations are to help Norliah identify her life goals, aid her in the process of thinking through their relative priority levels, and guide her down the path of fiscal and financial health.

What I cannot do for her in my role of financial planner is dictate how she should act. Ultimate responsibility for the full disclosure of all pertinent facts, dreams and goals lies with her. Based on the principle of GIGO – garbage in, garbage out – borrowed from the realm of information technology, the client (in this case Norliah) must be made to understand that the planner (I) can only act as a guide, consultant and even mentor, but not as the final decision maker.

1a. Norliah's present gross salary is RM12,000 per month. Once the impending RM3,000 raise comes into effect, her monthly salary will rise to RM15,000. On an annualised basis, that comes to a large (by Malaysian standards) annual gross remuneration package of RM180,000. If on top of that, her employer simultaneously tacks on a FIXED monthly entertainment allowance of RM2,000, then, by the rules of Malaysia's Inland Revenue Board (IRB), Norliah's taxable annual income will rise by RM24,000 a year. **Since she is going to have to spend RM24,000 anyway** in anticipated client entertainment – which is non-tax deductible either by her or the company employing her – Norliah is *likely* to end up in better shape if her employer were to do away with the promised fixed RM2,000 allowance.

Instead, if she were eligible by company rules to claim for out-of-pocket expenses as and when she entertained clients, Norliah herself would not be liable for the additional taxes, which would probably result in her saving 27% of RM24,000 (=RM6,480) in additional taxes. (Based on the information we have on her, it seems likely that Norliah will fall – either with or without the allowance – into the second highest personal income tax bracket of 27% (for taxable income within the range of RM150,001 and RM250,000). So, from a purely legal tax avoidance angle, taking the reimbursement on entertainment as an out-of-pocket expense is more efficient.

*(Note to reader: Do, however, note that there is also a trade-off: Norliah will lose out on the 12% employer's EPF payment that would have to be paid into her EPF account if she did accept this fixed allowance offer. For a more in-depth analysis, please refer to the following spreadsheet, as a guide:*

**Comparison between 2 remuneration packages**

	With allowance	Employer's contribution to EPF (12%)	Without allowance
Salary	180,000.00	21,600.00	180,000.00
Allowance	<u>24,000.00</u>	<u>2,880.00</u>	
Total EMPLOYMENT income	<u><u>204,000.00</u></u>	<u><u>24,480.00</u></u>	<u><u>180,000.00</u></u>
 <u>Income tax computation :</u>			
Gross employment income	204,000.00		180,000.00
Less :			
Personal relief	(8,000.00 )		(8,000.00 )
EPF & Insurance	<u>(5,000.00 )</u>		<u>(5,000.00 )</u>
Chargeable income	<u><u>191,000.00</u></u>		<u><u>167,000.00</u></u>
Income tax on :			
CHARGEABLE INCOME	<b><u>191,000.00</u></b>		<b><u>167,000.00</u></b>
On the first RM150,000	29,775.00		29,775.00
Next RM41,000 x 27%	11,070.00		-
	-	Next RM17,000 x 27%	4,590.00
Income tax	<u><u>40,845.00</u></u>		<u><u>34,365.00</u></u>
Salary (& allowance)	204,000.00		180,000.00
Reimbursement (TAX FREE)	-		24,000.00
Employer's EPF (12%)	24,480.00		21,600.00
Income Tax	<u>(40,845.00)</u>		<u>(34,365.00)</u>
	<u><u>187,635.00</u></u>		<u><u>191,235.00</u></u>
Difference:		→ 3,600.00 ←	

*Conclusion: Based on the marginal tax and EPF contribution rates used in this analysis, Norliah benefits to the tune of RM3,600 per year by NOT accepting the fixed allowance.)*

b. Because my responsibility to Norliah is to help her meet her life goals through the proper management of her finances, saving her almost RM6,500 a year in gross taxes (or RM3,600 in net benefits) through one simple piece of advice, should act as a 'trust earner' that will help her see the long-term advantages of choosing to cement a professional working relationship with me.

However, the relationship between client and planner is very much a two-way street.

My responsibilities to her as a CFP designee include the fiduciary responsibility of always looking out for her interests before my own. This key point is succinctly, but powerfully, encapsulated in **Rule 202** of the FPAM's Code of Ethics and Professional Responsibility: **'A financial planning practitioner shall act in the interest of the client.'** The not stated but obvious assumption here is that I owe Norliah the professional courtesy of acting in her **BEST** interests.

At the very least, this means I must exercise seven principles in all my dealings with Norliah. Those seven guiding principles are: integrity, objectivity, competence, fairness, confidentiality, professionalism and diligence.

With regard to the principle of objectivity, my actions must be governed by **Rule 201** of the FPAM's Code of Ethics and Professional Responsibility: **'A CFP designee shall exercise reasonable and prudent judgment in providing professional services.'**

Each principle generally does not stand in isolation. Many of them often interlink in specific client-centred issues. For instance, the principles of integrity, objectivity, fairness and professionalism all come into play in **Rule 401** of the FPAM's Code of Ethics and Professional Responsibility: **'In rendering professional services, a CFP designee shall disclose to the client:**

- (a) Material information relevant to the professional relationship, including but not limited to conflict(s) of interest(s), changes in the CFP designee's business affiliation, address, telephone number, credentials, qualifications, licenses, compensation structure and any agency relationship, and the scope of the CFP designee's authority in that capacity.**
- (b) The information required by all laws applicable to the relationship in a manner complying with such laws.'**

And even when communicating complete, relevant information to the client, an extremely high standard of compliance is expected by the FPAM. For instance, **Rule 408** of the Code states: **'When acting as an agent for a principal, a CFP designee shall assure that the scope of his or her authority is clearly defined and properly documented.'**

The principles of professionalism and diligence are best worked into the relationship by my adhering to established CFP procedure. This means that my responsibility to every client is to implement each of the CFP Board's six steps of the financial planning process. These steps are:

1. To establish and accurately define the client-planner relationship;
2. To gather all relevant data, including identifying and prioritising goals;
3. To analyse the client's current financial position;
4. To develop a financial plan, including putting forth alternatives;
5. To implement the plan that is decided upon by the client; and
6. To monitor the plan and review it at appropriately regular intervals.

All that, in a nutshell, outlines the overall level of responsibility I owe my clients.

In contrast, the clients' responsibilities to me are far less onerous. Taking this case as an example, Norliah's responsibility toward me – as an intelligent, prudent client – necessitates her taking the time and effort to provide me with sufficient information and accurate data to allow me to do my job well. Since, my practice – as specified in the body of the case study – is a fee- and commission-based one, Norliah also owes me the consideration of paying my fees on time. On a more specific note, since Norliah is a Muslim, there are limitations to the degree of flexibility she has in Willing away assets after her death. Because of Syariah considerations, Norliah may well need to take

personal responsibility for planned bequests by giving assets away while she is still alive. The precise manner of doing so is something that she will have to decide upon herself. As her financial planner, my role in this sensitive issue is limited to explaining the repercussions such acts might have upon her overall financial profile.

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Q2. Briefly, and in purely qualitative terms, describe ‘amortisation’. Your answer should focus on the conventional amortisation process itself and the effect it has on interest and principal repayments at the start and end of a loan period.

- g. Then, work out two basic amortisation tables – one showing the pertinent annual details of Norliah’s mortgage under the older, higher interest rate regime, and another showing details under the newer, lower interest rate regime. Show all your workings clearly, preferably using a spreadsheet, and calculate how much faster she will end up repaying her mortgage through her surprisingly wise decision to maintain her monthly mortgage payment quantum, and how much interest she saves. (Assume, for simplicity, that Norliah chooses NOT to use money from her EPF Account 2 to make principal reductions every three years. In real life situations, however, utilising that EPF withdrawal option would generally be an excellent course of action.)
- h. ASSUMING THE NOMINAL MONTHLY INTEREST RATE CHARGED IS 1.5%, work out how long Norliah would take to pay off her entire credit card balance if she adds RM1,000 a month in charges in the first 12 months of working with you, and makes her partial 20% of outstanding balance payments at the end of each month. Also, work out the total interest paid, the total principal paid, and the ratio between total interest to total principal. (Assume that after the first year of using your excellent services, she stops adding fresh charges to her credit card.)
- i. Use all the information garnered in parts 2(a) and 2(b) to explain to Norliah the concept of the ‘time value of money’.
- j. Based on all you know about her now, construct a simple Net Worth statement AND a simple Cashflow statement taking into account your perception of where she is TODAY. Then, construct an ‘ideal’ Cashflow statement for Norliah to replace the current one. (Use her current gross salary of RM12,000 per month, and assume that 40% of her net take-home pay is spent on miscellaneous items not touched upon explicitly in the scenario; in-depth querying on your part leads you to conclude that 50% of that two-fifths of portion is sheer wastage that doesn’t really add to Norliah’s quality of life). Outline a series of steps to improve her situation that will move her from the current Cashflow situation to the ideal one. Then construct one Net Worth statement showing her anticipated position one year from now, if she does nothing, and another Net Worth statement for the same timeframe, one year out, that reflects Norliah’s adherence to your advice based upon the ‘ideal’ Cashflow statement.

## SAMPLE ANSWER TO Q2.

A conventional dictionary definition of ‘amortisation’ is the act or process of amortising, which means to liquidate a loan by instalment payments.

A much clearer definition is found on page 67 of the HP 10B11 Financial Calculator handbook:

**Amorti(s)ation is the process of dividing a payment into the amount that applies to interest and the amount that applies to principal. Payments near the beginning of a loan contribute more interest, and less principal, than payments near the end of a loan.**

As is clearly understood from the second definition, within the context of normal day-to-day financial usage, the conventional amortisation process *generally* involves repaying a loan in equal sums. Each such payment contains a portion that repays interest and the remaining portion that goes toward repaying principal. Since the total loan amount outstanding is highest at the BEGINNING of a loan, during this part of the repayment period, the bulk of each equalised conventional payment (usually known as the monthly instalment) goes toward paying only interest, with very little going toward reducing the principal. However, as time goes on the incremental principal reductions begin to snowball.

This reduces the principal sum outstanding.

The less principal is owed, the lower the interest portion that accrues because of it. So much so that, toward the end of the loan period, the bulk of each instalment goes toward reducing the total principal still outstanding and very little needs to be 'wasted' on interest.

2a(1). The key features of Norliah's mortgage 'under the older, higher interest rate regime' are: Property – an upmarket condominium. Two years ago, Norliah borrowed RM400,000 to buy the condominium. There is no information given on the actual total purchase price of the property, which is fine since this information is not required to generate the ORIGINAL **loan amortisation table**. BLR = 6.8%, loan cost = 6.8% + 1.3% = 8.1%. Tenure is 20 years, which means that there is another 18 years to go, under the original mortgage. Fixed monthly payments = RM3,371.

## NORLIAH'S 'OLD' MORTGAGE

AMORTISATION TABLE			Year-end	
YEAR	MONTHS	Interest (RM)	Principal (RM)	Balance (RM)
1	1-12	32,094.24	8,357.76	391,642.24
2	13-24	31,391.55	9,060.45	382,581.80
3	25-36	30,629.79	9,822.21	372,759.59
4	37-48	29,803.98	10,648.02	362,111.57
5	49-60	28,908.74	11,543.26	350,568.30
6	61-72	27,938.23	12,513.77	338,054.53
7	73-84	26,886.12	13,565.88	324,488.66
8	85-96	25,745.56	14,706.44	309,782.22
9	97-108	24,509.11	15,942.89	293,839.33
10	109-120	23,168.69	17,283.31	276,556.02
11	121-132	21,715.59	18,736.41	257,819.61
12	133-144	20,140.31	20,311.69	237,507.91
13	145-156	18,432.58	22,019.42	215,488.50
14	157-168	16,581.28	23,870.72	191,617.78
15	169-180	14,574.33	25,877.67	165,740.11
16	181-192	12,398.65	28,053.35	137,686.76
17	193-204	10,040.04	30,411.96	107,274.80
18	205-216	7,483.13	32,968.87	74,305.93
19	217-228	4,711.24	35,740.76	38,565.17
20	229-240	1,706.31	38,565.17	0.00
TOTAL INTEREST =		<u>408,859.48</u>		

2a(2). The key features of Norliah's mortgage 'under the newer, lower interest rate regime' are: Same as above except for the following: For the first 21 months (2 years (= 24 months) minus 3 months – from text of case study) of the amortisation period, BLR = 6.8%, loan cost = 6.8% + 1.3% = 8.1%. Then, right at the beginning of month 22, BLR falls to 6.4%, so Norliah's loan cost = 6.4% + 1.3% = 7.7%. She maintains her monthly payments at RM3,371. The new tenure is currently unknown, but will be unearthed through the construction of the new amortisation table.

#### NORLIAH'S 'NEW' MORTGAGE

1	1-12	32,094.24	8,357.76	391,642.24
2	13-21	23,612.69	6,726.31	384,915.93
2	22-24	7,392.25	2,720.75	382,195.18
<b>2</b>	<b>13-24</b>	<b>31,004.94</b>	<b>9,447.06</b>	<b>382,195.18</b>
3	25-36	29,031.57	11,420.43	370,774.75
4	37-48	28,120.49	12,331.51	358,443.23
5	49-60	27,136.72	13,315.28	345,127.96
6	61-72	26,074.48	14,377.52	330,750.43
7	73-84	24,927.49	15,524.51	315,225.92
8	85-96	23,689.00	16,763.00	298,462.92
9	97-108	22,351.71	18,100.29	280,362.63
10	109-120	20,907.73	19,544.27	260,818.36
11	121-132	19,348.56	21,103.44	239,714.92
12	133-144	17,665.00	22,787.00	216,927.92
13	145-156	15,847.14	24,604.86	192,323.06
14	157-168	13,884.25	26,567.75	165,755.30
15	169-180	11,764.77	28,687.23	137,068.07
16	181-192	9,476.20	30,975.80	106,092.27
17	193-204	7,005.06	33,446.94	72,645.34
18	205-216	4,336.79	36,115.21	36,530.12
19	217-228	1,455.64	36,530.13	(0.00)
20	229-240	n.a.	n.a.	n.a.
TOTAL INTEREST =		<u>366,121.77</u>		

By comparing the two amortisation tables, it is obvious what the long-term impact of Norliah's wise choice of maintaining the quantum of her monthly instalments is. By doing so, **Norliah pays off her mortgage exactly one year earlier, in 19 years instead of 20.** In the process, she 'only' pays RM366,121.77 in interest as opposed to RM408,859.48 (under the older, higher interest rate scenario). **Norliah saves RM42,737.71**, without taking into consideration a calculated impact of the time value of money based upon an appropriate discount rate.

*(Note to reader: The RM42,737.71 in interest saved is in nominal terms, because of the time value of money.)*

2b. Before I generate the amortisation table relating to Norliah's credit card situation, this is what is unequivocally known about her intriguing situation:

Norliah has an overused gold Visa card.

Her current charges on it total RM23,000.

Nominal monthly interest rate charged = 1.5%.

In the first 12 months of working with me, she adds RM1,000 in fresh charges each month; all these charges are raked up at the start of each month (and stem from Norliah's tendency, prior to meeting me, of spending an average of RM1,000 a month more than she brings in. This means that since she has an existing balance on her card, she is not entitled to any interest-free period. The 1.5% per month is charged on the entire balance – old plus new charges. She also makes her partial 20% outstanding balance payments at the end of each month. [The minimum credit card payment for each month is 5% of the existing balance. This point does not seem relevant now, since Norliah does at least pay down 20% of her balance per month. However, the minimum payment is subject to a minimum absolute payment of RM50, unless the total balance falls below RM50, in which case the full sum must be repaid.]

After the first 12 months of working with me, Norliah stops adding fresh charges to her credit card. The inference is that she goes on a cash-only budget.

The following amortisation table contains the results of all these assumptions:

#### NORLIAH'S CREDIT CARD SITUATION

AMORTISATION TABLE				Year-end
YEAR	MONTHS	Interest (RM)	Principal (RM)	Balance (RM)
1	1-12	2,351.16	28,997.69	6,002.31
2	13-24	444.88	5,486.83	515.48
3	25-36	33.32	515.48	(0.00)

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Supporting Calculations for Question 2b.

Month	RM	Fresh Charges (RM)	Interest Bearing Charges (RM)	Monthly IR charge	New Total (RM)	Principal (RM)	Interest (RM)	Payment (RM)	Annual Interest (RM)	Annual Principal (RM)
1	23,000.00	1,000.00	24,000.00	1.500%	24,360.00	4,440.00	360.00	4,800.00		
2	19,560.00	1,000.00	20,560.00	1.500%	20,868.40	3,803.60	308.40	4,112.00		
3	16,756.40	1,000.00	17,756.40	1.500%	18,022.75	3,284.93	266.35	3,551.28		
4	14,471.47	1,000.00	15,471.47	1.500%	15,703.54	2,862.22	232.07	3,094.29		
5	12,609.24	1,000.00	13,609.24	1.500%	13,813.38	2,517.71	204.14	2,721.85		
6	11,091.53	1,000.00	12,091.53	1.500%	12,272.91	2,236.93	181.37	2,418.31		
7	9,854.60	1,000.00	10,854.60	1.500%	11,017.42	2,008.10	162.82	2,170.92		
8	8,846.50	1,000.00	9,846.50	1.500%	9,994.20	1,821.60	147.70	1,969.30		
9	8,024.90	1,000.00	9,024.90	1.500%	9,160.27	1,669.61	135.37	1,804.98		
10	7,355.29	1,000.00	8,355.29	1.500%	8,480.62	1,545.73	125.33	1,671.06		
11	6,809.56	1,000.00	7,809.56	1.500%	7,926.71	1,444.77	117.14	1,561.91		
12	6,364.79	1,000.00	7,364.79	1.500%	7,475.27	1,362.49	110.47	1,472.96	2,351.16	28,997.69
13	6,002.31	-	6,002.31	1.500%	6,092.34	1,110.43	90.03	1,200.46		
14	4,891.88	-	4,891.88	1.500%	4,965.26	905.00	73.38	978.38		
15	3,986.88	-	3,986.88	1.500%	4,046.69	737.57	59.80	797.38		
16	3,249.31	-	3,249.31	1.500%	3,298.05	601.12	48.74	649.86		
17	2,648.19	-	2,648.19	1.500%	2,687.91	489.91	39.72	529.64		
18	2,158.27	-	2,158.27	1.500%	2,190.65	399.28	32.37	431.65		
19	1,758.99	-	1,758.99	1.500%	1,785.38	325.41	26.38	351.80		
20	1,433.58	-	1,433.58	1.500%	1,455.08	265.21	21.50	286.72		
21	1,168.37	-	1,168.37	1.500%	1,185.89	216.15	17.53	233.67		
22	952.22	-	952.22	1.500%	966.50	176.16	14.28	190.44		
23	776.06	-	776.06	1.500%	787.70	143.57	11.64	155.21		
24	632.49	-	632.49	1.500%	641.97	117.01	9.49	126.50	444.88	5,486.83
25	515.48	-	515.48	1.500%	523.21	95.36	7.73	103.10		
26	420.11	-	420.11	1.500%	426.42	77.72	6.30	84.02		
27	342.39	-	342.39	1.500%	347.53	63.34	5.14	68.48		
28	279.05	-	279.05	1.500%	283.24	51.62	4.19	55.81		
29	227.43	-	227.43	1.500%	230.84	46.59	3.41	50.00		
30	180.84	-	180.84	1.500%	183.55	47.29	2.71	50.00		
31	133.55	-	133.55	1.500%	135.55	48.00	2.00	50.00		
32	85.55	-	85.55	1.500%	86.84	48.72	1.28	50.00		
33	36.84	-	36.84	1.500%	37.39	36.84	0.55	37.39		
34	(0.00)	-	(0.00)	1.500%	(0.00)	0.00	(0.00)	-		
35	(0.00)	-	(0.00)	1.500%	(0.00)	0.00	(0.00)	-		
36	(0.00)	-	(0.00)	1.500%	(0.00)	0.00	(0.00)	-	33.32	515.48
<b>Total</b>									<b>2,829.36</b>	<b>35,000.00</b>

Ratio between total interest and total principal repaid =

8.08%

Under these conditions, Norliah repays all her credit card debt inside 3 years. It actually takes only 33 months (or even less if she happens to come into excess money, such as a bonus, that can go toward a larger one-time payment toward principal). In the 33 months, without any additional payment, **she pays a total of RM2,829.36 in interest and RM35,000 in principal. The ratio between total interest and total principal paid in this situation is =  $2829.36/35000 = 0.0808$  or just over 8%.** (This is ratio is relatively low because Norliah actually took the trouble to pay 20% of her outstanding balance each month, and because she stopped adding fresh charges after the first year of working with a financial planner. Those who only pay the 5% minimum, as a matter of course, waste significantly far more of their finite financial resources on unnecessary interest charges.)

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2c. Based on all that has been discovered through these analyses of Norliah's mortgage and credit card situations, it should be relatively easy to explain to her the basic financial concept of the time value of money. According to the 'time value of money' entry in *Your A-Z Guide to the Stock Market – and all you need to know about capital terms* (© 1997 Rajen Devadason; published by Times Business, Singapore):

**Since money in your hands today can earn more money tomorrow through the power of compounding, it is intuitively obvious that \$100 given to you today is worth more than \$100 given to you tomorrow. For argument's sake, if you could earn 6% a year in a tax-free fixed deposit account, your \$100 today would be worth \$106 in one year. This dramatically illustrates the maxim that 'time is money'. Another way of looking at it would be to factor in the effects of inflation and realise that because of the erosion of purchasing power caused by that major economic blight, once again \$100 today buys more than \$100 tomorrow. If inflation runs at 4%, the same basket of goods you can buy for \$100 in the market today will cost you \$104 in 365 days. This change over time means that *time itself has some monetary worth if you start with any sum of cash.***

The key phrase in that definition is that 'time itself has some monetary worth'. This becomes as clear as crystal when we consider Norliah credit card debt situation:

Had she been able to pay of the outstanding RM23,000 at the start of the calculation period and also the 12 separate monthly RM1,000 charges, she would not have had to pay out a total of RM37,829.36 – comprising RM35,000 in principal and RM2,829.36. In this instance, the time value of money worked out to slightly over 8%, in simple interest terms.

In Norliah's home mortgage case, it is clear that when interest rates fell – and Norliah made the wise choice of maintaining the same quantum for her monthly mortgage payment – she (inadvertently) made each single ringgit of that RM3,371 monthly repayment count for slightly more over the REMAINING 17 years and 3 months of the amortisation period. This is *because each RM1 of those subsequent payments was working within a slightly lower interest rate regime.* Quite apart from being a subject of scrutiny for a mathematics theorist, this characteristic of money – its time value – has genuine practical application in everyone's life. In Norliah's mortgage example, her (initially inadvertent) decision to maintain the size of each mortgage payment resulted in total absolute savings of RM42,737.71.

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2d. Below are a simple Net Worth statement and a simple Cashflow statement based on all that is known about Norliah's **current** situation:

**NORLIAH'S 'CURRENT' NET WORTH STATEMENT**

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<u>NORLIAH'S</u>	<u>NET WORTH STATEMENT</u>	<u>AS AT</u> <u>TODAY</u>
<b>Assets</b>	<b>RM</b>	
Current account	5,000	
Fixed deposit account	2,000	
EPF	200,000	
Condominium (home)	400,000	<small>(Most conservative estimate based on loan quantum.)</small>
Car	145,000	
Others	-	
Total	<b>752,000</b>	
<b>Liabilities</b>	<b>RM</b>	
Family loans	0	
Credit Card balance	23,000	<small>(or even RM24,000, which would assume this month's fresh credit card expenses.)</small>
Mortgage	382,195	<small>(based on calculations done above, second amortisation table)</small>
Car Loan	136,195	<small>(see file Supporting 2dExtra)</small>
Others	0	
Total	<b>541,390</b>	
<b>Net Worth</b>	<b>= RM</b>	<b>210,610</b>

## NORLIAH'S 'CURRENT' CASHFLOW STATEMENT

### Cashflow Statement for Norliah:

		Present Situation (Month 1)
		RM
Gross salary		12000
Minus:	Employee's EPF (11%)	-1320
	Monthly tax deduction	-2141 (based on older tax tables. Also, note *)
<b>Net Salary</b>		<b>8539</b>
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<b>Inflow</b>		RM
Net Salary		8539
Other sources		0 **
<b>TOTAL INFLOW</b>		<b>8539</b>
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<b>Outflow</b>		
Credit Card payments		4800 (For CC payments, easiest to assume 20% of the figure used in the Net Worth statement.)
Mortgage Payment		3371
Car Instalment		2536 (calculated from data given in case study)
Miscellaneous		3416 (calculated from data given in case study: 40% of Net Salary)
<b>TOTAL OUTFLOW</b>		<b>14123</b>
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<b>NET CASH SURPLUS/(DEFICIT)</b>		<b>-5584</b>
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(Notes to reader:

\* You might ideally choose to update this figure based upon the most current IRB Schedule of Monthly Tax Deductions.

\*\* There is no need to factor in the prorated monthly interest earned from the RM2,000 fixed deposit account, since it is unlikely that Norliah will use that interest as part of her ongoing monthly cash inflow. However, should you decide to factor that in, presumably using an interest rate of about 4% interest rate, then an additional RM6 or RM7 would appear under 'Inflow'.)

A quick look at Norliah's current Net Worth statement reveals some rather frightening trends. It is obvious that her consistent over-expenditure throughout the preceding year, averaging RM1,000 a month, has resulted in a ballooning of her credit card account's outstanding balance. It is no wonder that Norliah found herself confiding in her friend Melanie that despite the excellent salary she, Norliah, was making, she still felt pangs of apprehension about the future.

It is likely that prior to my construction of her current Net Worth statement, Norliah was not aware of just how much out of whack her spending pattern was relative to her earning capacity.

The next phase of this exercise involves constructing an 'ideal' Cashflow statement that halves the 'miscellaneous' expenditure (**based on the previous 'miscellaneous' figure**

**that is calculated by taking 40% of the net take-home pay derived from a gross salary of RM12,000 a month, NOT based upon the new, higher net salary) but otherwise factors in the effects of the higher salary.**

Because of the facts of the case, this ideal situation can only begin *next* month, when Norliah's salary jumps by RM3,000 to RM15,000. As a result of this one-month lag, the credit card outpayment is also reduced. Analysis shows that the following month's credit card payment should be 20% of RM20,560 = RM4,112:

#### NORLIAH'S 'IDEAL' CASHFLOW STATEMENT

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##### Cashflow Statement for Norliah:

		New Situation (Month 2)
		RM
Gross salary		15000
Minus:	Employee's EPF (11%)	-1650
	Monthly tax deduction	-2999 (based on older tax tables.)
<b>Net Salary</b>		<b>10351</b>
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<b>Inflow</b>		RM
Net Salary		10351
Other sources		0 (** see note above)
<b>TOTAL INFLOW</b>		<b>10351</b>
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<b>Outflow</b>		
Credit Card payments		4112
Mortgage Payment		3371
Car Instalment		2536
Miscellaneous		1708 (***) Half of RM3,416 (see previous Cashflow Statement (Month 1))
<b>TOTAL OUTFLOW</b>		<b>11727</b>
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<b>NET CASH SURPLUS/(DEFICIT)</b>		<b>-1376</b>
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*(Note to reader:*

*\*\*\* Based on information given above, for this part of the modelling the old scenario based upon of a gross salary of RM12,000 is to prevail. The correct amount, therefore, for this line item is NOT RM2,070 (which would be 20% of the new net pay) but RM1,708 (which is 50% of the old miscellaneous expense item).*

Even with the noted changes, Norliah is suffering a one-month deficit of RM1,376, in Month 2. This, thankfully, is a short-term situation due to the rapidly falling credit card balances. **But the most pressing issue at hand is how is she to fund the short-term monthly deficits?** For the first two months of our period under review, we know that those deficits come to RM5,584 for the 'current month' and RM1,376 for the next month, based, respectively on the two preceding cashflow tables.

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Now, from our base case scenario, we know that at the start of Month 1, Norliah had RM7,000 in the bank. There is no other obvious source of funds, based on the information in the case study. Unlike most other people in such dire circumstances, Norliah's strained family ties logically preclude a high probability of her going to her father or some other member of the Kelantanese clan. But perhaps she can swing a 'soft loan' from Melanie?

However, if we assume that Norliah does NOT resort to borrowing money from a friend to make up the difference, this means that she will need to break her RM5,000 FD and bump up her current account balance from RM2,000 to RM7,000.

After the first month's deficit, this will leave her with  $RM(7,000 - 5,584) = RM1,416$ . After the second month's deficit of RM1,376, that leaves her with just RM40 to fund any monthly deficit after Month 2. But, as the following cashflow statement for Month 3 (Version 1) shows, Norliah's deficit for that month under the modelled conditions is RM815!

**Cashflow Statement for Norliah:**

**(Month 3 Version 1)**

	<b>RM</b>
Gross salary	15000
Minus: Employee's EPF (11%)	-1650
Monthly tax deduction	-2999 (based on older tax tables.)
<b>Net Salary</b>	<b>10351</b>
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<b>Inflow</b>	<b>RM</b>
Net Salary	10351
Other sources	0 **
<b>TOTAL INFLOW</b>	<b>10351</b>
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<b>Outflow</b>	
Credit Card payments	3551.28 (Month 3)
Mortgage Payment	3371
Car Instalment	2536
Miscellaneous	1708 (***)
<b>TOTAL OUTFLOW</b>	<b>11166</b>
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<b>NET CASH SURPLUS/(DEFICIT)</b>	<b>-815</b>
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Having already slashed her miscellaneous expense item by 50%, and then retaining it at a level that is pegged to her lower gross salary of RM12,000 instead of her new (and current, from Month 2) gross salary of RM15,000 per month, it seems fair to assume that this line item should not be reduced further.

Furthermore, Norliah has effectively no say in unilaterally deciding to reduce the quantum of her car or home mortgage payment. The only other cash outflow item is the credit card payment! So, assuming she does not want to attempt to elicit a soft loan from Melanie or some other close friend, the most sensible thing for her to do would be to alter her credit card repayment pattern, **so that her cashflow statement BALANCES.**

Thankfully, up to this point Norliah has been making four times the minimum required payment on that account. This gives her some leeway to make an adjustment in that line item to enhance her cashflow position.

Note that Norliah starts the month with RM40 left in her depleted current account. This means that the largest deficit she can sustain in Month 3 is RM40. It follows on from that inescapable conclusion that the largest credit card payment she is fiscally capable of making that month is  $RM(815 - 40) = RM775$  LESS than the projected RM3,551.28, or about RM2,776.

However, running a completely balanced monthly cashflow position is not wise if that 'budget' does not include a savings allocation to an emergency buffer account. **Because of the way cashflow statements are constructed, it is best to adjust the appropriate line items to generate a cashflow SURPLUS at the end of the month to fund that savings allocation.**

Therefore, the most sensible advice that I can give Norliah at this juncture is to ask her to allocate, say, **RM2,500** on a FIXED basis to her credit card account. This will leave her with a RM236 [=RM2,776 – RM2,500 – RM40] monthly surplus, which she can channel (along with the residual RM40 surplus from the Month 2 cashflow statement) to a bank savings account or a secure bond fund.

*(Note to reader: This call, while sensible, is highly subjective. No two financial planners will come up with exactly the same allocation. And that's acceptable. The point of this entire convoluted exercise is to help Norliah help herself!)*

This new scenario is shown below:

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**Cashflow Statement for Norliah:**

**(Month 3 Version 2)**

	<b>RM</b>
Gross salary	15000
Minus: Employee's EPF (11%)	-1650
Monthly tax deduction	-2999 (based on older tax tables.)
<b>Net Salary</b>	<b>10351</b>

<b>Inflow</b>	<b>RM</b>
Net Salary	10351
Other sources	0 **
<b>TOTAL INFLOW</b>	<b>10351</b>

<b>Outflow</b>	
<b>Credit Card payments</b>	<b>2500</b> (based on the adjustment argued for above.)
Mortgage Payment	3371
Car Instalment	2536
Miscellaneous	1708 (***)
<b>TOTAL OUTFLOW</b>	<b>10115</b>

<b>NET CASH SURPLUS/(DEFICIT)</b>	<b>236</b>
Allocation to savings	236

If that plan is carried out from 'Month 3', this new model shows what happens on the credit card front.

Supporting Calculations for Question 2d.											
Month	RM	Fresh Charges (RM)	Interest Bearing Charges (RM)	Monthly IR charge	New Total (RM)	Principal (RM)	Interest (RM)	Payment (RM)	Annual Interest (RM)	Annual Principal (RM)	New Balance (RM)
1	23,000.00	1,000.00	24,000.00	1.500%	24,360.00	4,440.00	360.00	<b>4,800.00</b>			19,560.00
2	19,560.00	1,000.00	20,560.00	1.500%	20,868.40	3,803.60	308.40	<b>4,112.00</b>			16,756.40
3	16,756.40	1,000.00	17,756.40	1.500%	18,022.75	2,233.65	266.35	<b>2,500.00</b>	(Note change.)		15,522.75
4	15,522.75	1,000.00	16,522.75	1.500%	16,770.59	2,252.16	247.84	<b>2,500.00</b>			14,270.59
5	14,270.59	1,000.00	15,270.59	1.500%	15,499.65	2,270.94	229.06	<b>2,500.00</b>			12,999.65
6	12,999.65	1,000.00	13,999.65	1.500%	14,209.64	2,290.01	209.99	<b>2,500.00</b>			11,709.64
7	11,709.64	1,000.00	12,709.64	1.500%	12,900.29	2,309.36	190.64	<b>2,500.00</b>			10,400.29
8	10,400.29	1,000.00	11,400.29	1.500%	11,571.29	2,329.00	171.00	<b>2,500.00</b>			9,071.29
9	9,071.29	1,000.00	10,071.29	1.500%	10,222.36	2,348.93	151.07	<b>2,500.00</b>			7,722.36
10	7,722.36	1,000.00	8,722.36	1.500%	8,853.19	2,369.16	130.84	<b>2,500.00</b>			6,353.19
11	6,353.19	1,000.00	7,353.19	1.500%	7,463.49	2,389.70	110.30	<b>2,500.00</b>			4,963.49
12	4,963.49	1,000.00	5,963.49	1.500%	6,052.94	2,410.55	89.45	<b>2,500.00</b>	<b>2,464.94</b>	<b>31,447.06</b>	<b>3,552.94</b>
13	3,552.94	-	3,552.94	1.500%	3,606.24	2,446.71	53.29	<b>2,500.00</b>			1,106.24
14	1,106.24	-	1,106.24	1.500%	1,122.83	1,106.24	16.59	<b>1,122.83</b>			-
15	-	-	-	1.500%	-	-	-	-			-
16	-	-	-	1.500%	-	-	-	-			-
17	-	-	-	1.500%	-	-	-	-			-
18	-	-	-	1.500%	-	-	-	-			-
19	-	-	-	1.500%	-	-	-	-			-
20	-	-	-	1.500%	-	-	-	-			-
21	-	-	-	1.500%	-	-	-	-			-
22	-	-	-	1.500%	-	-	-	-			-
23	-	-	-	1.500%	-	-	-	-			-
24	-	-	-	1.500%	-	-	-	-	<b>69.89</b>	<b>3,552.94</b>	-
25	-	-	-	1.500%	-	-	-	-			-
26	-	-	-	1.500%	-	-	-	-			-
27	-	-	-	1.500%	-	-	-	-			-
28	-	-	-	1.500%	-	-	-	-			-
29	-	-	-	1.500%	-	-	-	-			-
30	-	-	-	1.500%	-	-	-	-			-
31	-	-	-	1.500%	-	-	-	-			-
32	-	-	-	1.500%	-	-	-	-			-
33	-	-	-	1.500%	-	-	-	-			-
34	-	-	-	1.500%	-	-	-	-			-
35	-	-	-	1.500%	-	-	-	-			-
36	-	-	-	1.500%	-	-	-	-			-
<b>Total</b>									<b>2,534.83</b>	<b>35,000.00</b>	

Ratio between total interest and total principal repaid =

7.24%

Note that the entire amount is repaid in 14 months, with a total outlay from start to finish of RM37,534.83 – comprising RM35,000 in principal and RM2,534.83 in interest. This means Norliah repays all her credit card debt 19 months faster than she would under the previous scenario using strict 20% of outstanding balance payments. She saves almost RM300 in interest.

Far more importantly, she would have beneficially altered her profligate spending pattern and begun the habit of regular saving. Within the first 12 months of working with me, she would actually build up a genuine savings buffer of about **RM2,400** [roughly equal to RM40 plus RM236 x 10 months (based on surpluses generated in Months 3 to 12), taking into account rounding effects)]. **See below for ‘SET 2 CASHFLOW STATEMENTS: IDEAL SCENARIO’.**

While the second option does make better economic sense than the first, the ultimate choice lies with Norliah. Whatever she chooses to do, it is markedly obvious that Norliah came to see me just in time. And it is just as fortunate that her large pay increment came when it did.

The next part of the question requires two sets of 12 monthly cashflow projections – UNCHANGED and IDEAL.

Both sets begin with the same Current Cashflow situation but then differ for the remaining 11 monthly cashflow projections.

In the UNCHANGED scenario, I factor in Norliah’s pay increment from Month 2, but everything else stays the same. The credit card payment situation here is modelled in line with those assumptions. Norliah’s miscellaneous expenses remain at RM3,416 per month.

In the IDEAL scenario, I also factor in her pay increment from Month 2, but I alter the credit card payment pattern in the way just described. This situation is modelled in line with those revisions.

I also put Norliah on a ‘fiscal diet’ aimed at reducing her monthly miscellaneous expenses to RM1,708.

To recap: **I am generating TWO separate Net Worth statements showing alternate possible financial scenarios.** The UNCHANGED, ‘bad’, scenario will grow out of Norliah’s unwillingness to follow my advice. The IDEAL, ‘good’, scenario is based upon the assumption that Norliah is willing to follow my advice.

#### **SET 1 CASHFLOW STATEMENTS: UNCHANGED SCENARIO**

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MONTH:	1	2	3	4	5	6	7	8	9	10	11	12
	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
Gross salary	12000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
Minus: Employee's EPF (11%)	-1320	-1650	-1650	-1650	-1650	-1650	-1650	-1650	-1650	-1650	-1650	-1650
Monthly tax deduction	-2141	-2999	-2999	-2999	-2999	-2999	-2999	-2999	-2999	-2999	-2999	-2999
<b>Net Salary</b>	<b>8539</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>
Opening cash position (RM):	7000	1416	-1668	-4191	-6257	-7951	-9341	-10484	-11426	-12203	-12846	-13380
<b>Inflow</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>
Net Salary	8539	10351	10351	10351	10351	10351	10351	10351	10351	10351	10351	10351
Other sources	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL INFLOW</b>	<b>8539</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>
<b>Outflow</b>												
Credit Card payments	4800	4112	3551	3094	2722	2418	2171	1969	1805	1671	1562	1473
Mortgage Payment	3371	3371	3371	3371	3371	3371	3371	3371	3371	3371	3371	3371
Car Instalment	2536	2536	2536	2536	2536	2536	2536	2536	2536	2536	2536	2536
Miscellaneous	3416	3416	3416	3416	3416	3416	3416	3416	3416	3416	3416	3416
<b>TOTAL OUTFLOW</b>	<b>14123</b>	<b>13435</b>	<b>12874</b>	<b>12417</b>	<b>12045</b>	<b>11741</b>	<b>11494</b>	<b>11292</b>	<b>11128</b>	<b>10994</b>	<b>10885</b>	<b>10796</b>
<b>NET CASH SURPLUS/(DEFICIT)</b>	<b>-5584</b>	<b>-3084</b>	<b>-2523</b>	<b>-2066</b>	<b>-1694</b>	<b>-1390</b>	<b>-1143</b>	<b>-941</b>	<b>-777</b>	<b>-643</b>	<b>-534</b>	<b>-445</b>
Closing cash position (RM):	1416	-1668	-4191	-6257	-7951	-9341	-10484	-11426	-12203	-12846	-13380	<b>(13,824)</b>

## SET 2 CASHFLOW STATEMENTS: IDEAL SCENARIO

MONTH:	1	2	3	4	5	6	7	8	9	10	11	12
	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
Gross salary	12000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
Minus: Employee's EPF (11%)	-1320	-1650	-1650	-1650	-1650	-1650	-1650	-1650	-1650	-1650	-1650	-1650
Monthly tax deduction	-2141	-2999	-2999	-2999	-2999	-2999	-2999	-2999	-2999	-2999	-2999	-2999
<b>Net Salary</b>	<b>8539</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>
Opening cash position (RM):	7000	1416	41	277	513	749	985	1222	1458	1694	1930	2166
<b>Inflow</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>	<b>RM</b>
Net Salary	8539	10351	10351	10351	10351	10351	10351	10351	10351	10351	10351	10351
Other sources	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL INFLOW</b>	<b>8539</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>	<b>10351</b>
<b>Outflow</b>												
Credit Card payments	4800	4112	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Mortgage Payment	3371	3371	3371	3371	3371	3371	3371	3371	3371	3371	3371	3371
Car Instalment	2536	2536	2536	2536	2536	2536	2536	2536	2536	2536	2536	2536
Miscellaneous	3416	1708	1708	1708	1708	1708	1708	1708	1708	1708	1708	1708
<b>TOTAL OUTFLOW</b>	<b>14123</b>	<b>11727</b>	<b>10115</b>	<b>10115</b>	<b>10115</b>	<b>10115</b>	<b>10115</b>	<b>10115</b>	<b>10115</b>	<b>10115</b>	<b>10115</b>	<b>10115</b>
<b>NET CASH SURPLUS/(DEFICIT)</b>	<b>-5584</b>	<b>-1376</b>	<b>236</b>	<b>236</b>	<b>236</b>	<b>236</b>	<b>236</b>	<b>236</b>	<b>236</b>	<b>236</b>	<b>236</b>	<b>236</b>
Closing cash position (RM):	1416	41	277	513	749	985	1222	1458	1694	1930	2166	<b>2,403</b>

A quick look at the closing cashflow positions of each set shows that by following my recommendations Norliah should be able to improve her 'Closing cash position' for the year by more than RM16,000. Compare the **RM13,824 deficit** in Set 1 with the **RM2,403 surplus** in Set 2. *(The interest that will be earned by Norliah in her gradually growing savings surplus has not been included here.)*

Once these two sets of cashflow statements are constructed, it is relatively straightforward deriving the resultant respective Net Worth statements.

But before that can be done, it is important to realise that in both scenarios Norliah's EPF balance grows in line with the conditions given in the case study, while her home and car liabilities fall by logical amounts based upon the repayment conditions. The changes in these three items are calculated in these files: Supporting 2d EPF.xls; Supporting 2d MORTGAGE.xls; and Supporting 2d CAR HP.xls. (However, only the first two are embedded here. The third file, on the car payment calculations, is too large to show here.)

**NORLIAH'S EPF POSITION:**

EPF Position						
		RM				
Opening balance for the year		200,000.00				
Notes: Assume the 5.5% EPF dividend is paid at the end of month 12.						
Norliah's monthly gross salary in month 1 is (RM)		12,000.00				
Norliah's monthly gross salary in months 2 to 12 is (RM)		15,000.00				
Norliah's Opening EPF balance (RM)		200,000.00				
Dividend on the full opening balance (5.5%)		11,000.00				
Contributions and adjustments throughout the year:						
Month	Gross Salary (RM)	Employer's Contribution (12%)	Employee's Contribution (11%)	Total Contribution	Prorated dividends (See Note 1, below)	
1	12,000.00	1,440.00	1,320.00	2,760.00	139.15	
2	15,000.00	1,800.00	1,650.00	3,450.00	158.13	
3	15,000.00	1,800.00	1,650.00	3,450.00	142.31	
4	15,000.00	1,800.00	1,650.00	3,450.00	126.50	
5	15,000.00	1,800.00	1,650.00	3,450.00	110.69	
6	15,000.00	1,800.00	1,650.00	3,450.00	94.88	
7	15,000.00	1,800.00	1,650.00	3,450.00	79.06	
8	15,000.00	1,800.00	1,650.00	3,450.00	63.25	
9	15,000.00	1,800.00	1,650.00	3,450.00	47.44	
10	15,000.00	1,800.00	1,650.00	3,450.00	31.63	
11	15,000.00	1,800.00	1,650.00	3,450.00	15.81	
12	15,000.00	1,800.00	1,650.00	3,450.00	-	
Total Contributions for the year (RM)				40,710.00		
Total Prorated dividends for the year (RM) @ 5.5%					1,008.84	
Closing Balance for the year (RM) = 200,000+11,000+40,710+1,008.84 =					252,718.84	

*(Notes to reader:*

*1. Method of computing prorated dividends: Consider the case in Month 1, for which the total contribution earns 11 months of interest.  $RM139.15 = 11 \text{ months} \times (0.055/12) \times 2,760$  (total contribution for the month).*

*2. For simplicity, the model answer assumes the dividend is paid at the end of month 12.)*

## NORLIAH'S MORTGAGE POSITION:

MORTGAGE										
Month	RM	Nominal Interest Rate	Monthly IR charge	New Total (RM)	Principal (RM)	Interest (RM)	Payment (RM)	Annual Interest (RM)	Annual Principal (RM)	New Balance (RM)
1	382,195.18	7.70%	0.642%	384,647.60	918.58	2,452.42	3,371.00			381,276.60
2	381,276.60	7.70%	0.642%	383,723.12	924.48	2,446.52	3,371.00			380,352.12
3	380,352.12	7.70%	0.642%	382,792.72	930.41	2,440.59	3,371.00			379,421.72
4	379,421.72	7.70%	0.642%	381,856.34	936.38	2,434.62	3,371.00			378,485.34
5	378,485.34	7.70%	0.642%	380,913.95	942.39	2,428.61	3,371.00			377,542.95
6	377,542.95	7.70%	0.642%	379,965.52	948.43	2,422.57	3,371.00			376,594.52
7	376,594.52	7.70%	0.642%	379,011.00	954.52	2,416.48	3,371.00			375,640.00
8	375,640.00	7.70%	0.642%	378,050.36	960.64	2,410.36	3,371.00			374,679.36
9	374,679.36	7.70%	0.642%	377,083.55	966.81	2,404.19	3,371.00			373,712.55
10	373,712.55	7.70%	0.642%	376,110.54	973.01	2,397.99	3,371.00			372,739.54
11	372,739.54	7.70%	0.642%	375,131.29	979.25	2,391.75	3,371.00			371,760.29
<b>12</b>	<b>371,760.29</b>	<b>7.70%</b>	<b>0.642%</b>	<b>374,145.75</b>	<b>985.54</b>	<b>2,385.46</b>	<b>3,371.00</b>	<b>29,031.57</b>	<b>11,420.43</b>	<b>370,774.75</b>

## NORLIAH'S CAR HIRE PURCHASE POSITION:

### NOTES:

1. The calculations for the car loan will require knowing how finance companies calculate the outstanding sum on an HP loan with this formula:

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Malaysian Hire Purchase (HP) Interest calculation

= (Number of months to maturity/sum of all months in loan tenure) x total term charges

To understand this fully, it is important to replicate Norliah's entire HP amortisation table.

Norliah borrows RM150,000

Nominal Interest rate                      6%

Loan duration                                      7 years, or 84 months

Her total term charges come to RM63,000

Total amount owed if loan is carried to full term = RM213,000

Cost per month = RM2,536

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2. For those who do not work in finance companies, the actual method of calculating HP loans can be a little difficult to understand. Unlike a conventional P & I loan (principal plus interest), which has interest calculated in an intuitively easy-to-understand manner – regardless of whether ‘rest period’ is daily, monthly or yearly – HP loans are amortised based upon what is known as the ‘sum-of-digits’ method. This is also known as the Rule of 78. Why that is so is explained in *Liberty! From Debt-Slave to Money Master*, © 2000-2002 Rajen Devadason, published by i2Media Publishing; pp. 116-117. The explanation begins with a look at a one-year (12-month) HP loan:

**If you mull over things for a bit you'll realise that you use 12 times as much capital in the first month of your loan as you do in the final month. So, it makes sense (after a fashion) to be charged 12 times as much interest in the first month than in the 12<sup>th</sup>. Remember also that our basic unit of comparison is the interest charge of the 12<sup>th</sup> month. So, by extension, it similarly makes sense to charge 11 times as much interest in the second month, 10 times as much in the third month, and so on all the way down to 2 times as much in the 11<sup>th</sup> month and 1 time as much (duh!) in the 12<sup>th</sup> month.**

**Toward this end, a little algebra goes a long way to simplify things. The total amount of interest charged (I) over the entire loan tenure is related to the amount charged in month 12 (namely, i), in this way:**

$$I = 12i + 11i + 10i + \dots + 3i + 2i + i = 78i$$

**And that, my friend, is where the ‘78’ used to christen the ‘The Rule’ comes in! There are 12 months in one year and the sum of digits (of months) from 1 to 12 = 78.**

For this example, the instalment of the first month contains 12/78 of the total interest charge; the second instalment contains 11/78, and so on all the way down to the 12<sup>th</sup> and final month when 1/78 of total interest is allocated. In other words, if you decided to prepay your loan in the first month, the finance company would figure that 12/78 of the total interest payable was attached to the first instalment and would only refund you 66/78 of your interest. If you prepaid your loan in the second month, then  $(12+11)/78 = 23/78$  would be attached to the first two instalments and you would get a rebate amounting to  $(78-23)/78 = 55/78$  of total interest payable, and so on.

In Malaysia, car HP loans usually run from one through to seven years. So, for your easy reference, here is the sum of digits (of months) for all those periods:

1 year = 12 months = SUM(1 to 12) = 78  
2 years = 24 months = SUM(1 to 24) = 300  
3 years = 36 months = SUM(1 to 36) = 666  
4 years = 48 months = SUM(1 to 48) = 1,176  
5 years = 60 months = SUM(1 to 60) = 1,830  
6 years = 72 months = SUM(1 to 72) = 2,628  
7 years = 84 months = SUM(1 to 84) = 3,570

*By force of custom, the 'sum-of-digits' method is used interchangeably with the 'Rule of 78', even when the loan period under consideration is not 12 months.*

Once all this groundwork is completed, the data from the various sources can be pulled together to form the TWO different Net Worth statements the question asks for, namely:

- 
1. Norliah's position one year from now if she DOES NOTHING; and
  2. Norliah's position one year from if she FOLLOWS MY ADVICE BASED ON THE 'IDEAL' CASHFLOW situation.
- 

To aid comparison, both Net Worth statements are constructed side by side below, with the present Net Worth statement.

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## **ADDITIONAL KEY NOTES CONCERNING NORLIAH'S ASSETS AND LIABILITIES:**

*(Note to readers: Every financial planner will make different assumptions. The information, analyses and assumptions that follow are provided ONLY as a guide for your benefit.)*

**1. Current account** – the money here will be quickly depleted by the monthly deficits that Norliah runs up in Month 1 and Month 2. Thankfully, under the 'IDEAL SCENARIO' Norliah will be able to replenish this stash of cash in either this account or a savings account or a safe income fund. Under the 'UNCHANGED SCENARIO', Norliah will have to contend with a huge year-end deficit (RM13,824, according to SET 1 CASHFLOW STATEMENTS: **UNCHANGED SCENARIO**) and therefore is unlikely to have any money in this account; assume zero. However, as mentioned, under the 'IDEAL SCENARIO', Norliah will have a year-end surplus (RM2,403, according to SET 2 CASHFLOW STATEMENTS: **IDEAL SCENARIO**), which should be modelled in the IDEAL Net Worth statement.

**(Savings account** – see explanation above.)

**2. Fixed deposit account** – the money will be depleted and is unlikely to be replenished here under either future scenario.

**3. EPF** – based on the calculations shown above, Norliah's EPF balance rises from RM200,000 to RM252,718.84; this is true under either scenario.

**4. Home** – assume the condo's market value doesn't change over the course of the year; conservatively use RM400,000.

**5. Car** – in the one year that Norliah has already owned her car, it has fallen in value from RM180,000 to RM145,000. In percentage terms, that represents a 19.4% drop. Assuming the steepest loss of value is suffered in the first year of ownership, it seems fair to assume that the car will only lose another 10% to 15% of its End of Year 1 of ownership value by the End of Year 2 of ownership. That suggests a market value, then, of between roughly RM123,000 and RM131,000. To err on the side of conservatism, I shall use RM125,000.

**6. Other assets** – assume nothing else is owned of monetary value.

**7. Family loans** – based on Norliah's strained relationship with her Kelantanese family, it seems unlikely she will choose to borrow money from them. Assume zero for both scenarios.

**8. Credit card balance** – under the UNCHANGED SCENARIO's credit card repayment pattern, the outstanding balance after 12 months will be RM6,002.31. Under the IDEAL SCENARIO modelled, the corresponding balance is RM3,552.94.

**9. Mortgage** – as shown above, the closing balance for the year under both scenarios is the same: RM370,774.75.

**10. Car loan** – based upon the Rule of 78 calculations carried out in 'Supporting 2d CAR HP.xls', (a file too large to be shown here) the closing balance for the year under both scenarios is the same: RM119,848.74.

**11. Other liabilities** – as mentioned above in the notes for the current account, under the 'UNCHANGED SCENARIO', Norliah will have to contend with a huge year-end deficit (RM13,824, according to SET 1 CASHFLOW STATEMENTS: **UNCHANGED**

**SCENARIO.** This money will have to be borrowed from some source. In a ‘best-case’ version of this depressing situation, she will be able to do so at zero interest. Assuming this is the case, her other liabilities under the UNCHANGED SCENARIO will equal RM13,824. *Under the IDEAL SCENARIO, she will actually have a positive balance of RM2,403 in a current or savings account and have nothing outstanding under ‘other liabilities’; in that case, assume zero.*

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## WHAT FINANCIAL STATE WILL NORLIAH BE IN ONE YEAR FROM NOW?

### NORLIAH'S PRESENT AND 'NEW' NET WORTH STATEMENTS:

	Present Situation RM	IN ONE YEAR'S TIME UNDER THE		
		UNCHANGED		IDEAL
		SCENARIO	Note	SCENARIO
	RM	RM	RM	
<b>Assets</b>				
Current/Savings account	5,000	0	<b>1</b>	2403
Fixed deposit account	2,000	0	<b>2</b>	0
EPF	200,000	252,719	<b>3</b>	252,719
Condominium (home)	400,000	400,000	<b>4</b>	400,000
Car	145,000	125,000	<b>5</b>	125,000
Others	-	0	<b>6</b>	0
<b>Total</b>	<b>752,000</b>	<b>777,719</b>		<b>780,122</b>
<b>Liabilities</b>				
	<b>RM</b>			
Family loans	0	0	<b>7</b>	0
Credit Card balance	23,000	6,002	<b>8</b>	3,553
Mortgage	382,195	370,775	<b>9</b>	370,775
Car Loan	136,195	119,849	<b>10</b>	119,849
Others	0	13,825	<b>11</b>	0
<b>Total</b>	<b>541,390</b>	<b>510,451</b>		<b>494,176</b>
<b>Net Worth</b>	<b>210,610</b>	<b>267,268</b>		<b>285,945</b>

Under **both** scenarios, Norliah manages to raise the value of her gross assets, to reduce her total liabilities, and to enhance her Net Worth position. However, by following my advice, she ends up with a marginal 0.3% improvement in her gross asset position (comparing the “UNCHANGED SCENARIO” with the ‘IDEAL SCENARIO’). Thankfully, the improvement in her liabilities position is about 10 times greater (in pure percentage terms, as compared to the mere 0.3% enhancement of gross asset value): she enjoys a 3.2% drop in total liabilities. And what’s more astounding is that, taken together, these improvements result in an almost 7% enhancement of her Net Worth position.

Far more importantly, Norliah has begun to take serious steps to achieve her life goals through the proper management of her finances.

Q3. Since Norliah tends to live ‘like there is no tomorrow’, carefully and gently explain to her the meaning of this guiding principle: **The key to reaching financial freedom is to focus on strengthening your net worth statement.** Focus on giving her advice on how best to get out of debt – touching on two workable strategies – and, eventually, channel freed cashflow into a series of appropriate investments. Explain which of the two methodologies you will use and why. Do so briefly, without going into excessive detail.

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### SAMPLE ANSWER TO Q3.

Once again, here is Norliah’s original net worth statement prior to any changes resulting from her impending RM3,000 jump in gross salary or my subsequent advice to her:

#### NORLIAH’S ‘CURRENT’ NET WORTH STATEMENT

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<u>NORLIAH’S</u>	<u>NET WORTH STATEMENT</u>	<u>AS AT TODAY</u>
<b>Assets</b>	<b>RM</b>	
Current account	5,000	
Fixed deposit account	2,000	
EPF	200,000	
Condominium (home)	400,000	
Car	145,000	
Others	-	
Total	<u>752,000</u>	
<b>Liabilities</b>	<b>RM</b>	
Family loans	0	
Credit Card balance	23,000	
Mortgage	382,195	
Car Loan	136,195	
Others	0	
Total	<u>541,390</u>	

**Net Worth = RM 210,610**

With gross assets exceeding three quarters of a million ringgit, on the surface Norliah seems successful. However, when we look closely at the composition of her entire net worth statement, two things become obvious:

1. Her gross assets are swamped by just two items, her condominium and her car, neither of which can be called an investment in the strictest sense of the word. After all, Norliah lives in the condo, thus precluding its current use as a source of rental income. Also, for as long as she lives in it, she can’t sell it for a potential

capital gain. As for her car, all that can be said with confidence is that it is fast depreciating.

2. Her liabilities are relatively large – well in excess of half a million ringgit – and cost her a great deal each month to service.

Unfortunately, many urban Malaysians are accustomed to having Net Worth statements similar to Norlia's. As a group, we seem to innately disregard the wisdom espoused by our ancestors. Asian wisdom that was, nonetheless, often couched in terms similar to those used by Thomas Jefferson when he flatly stated, "Never spend money before you have it."

It isn't the job of a financial planner to preach. But it is crucial that our clients understand there are always consequences for our actions. Norlia's Net Worth statement makes it clear that she is a little too used to the 'good life'.

Thankfully, it also appears that Norlia loves her work. Yet, it is reasonable to assume that she – like most of us – doesn't want to *have* to keep working for the rest of her life just to continue to pay off rising bills and stubborn debts that stem from her chosen lifestyle.

If she wants things to improve, Norlia needs a mindset change that hinges on this principle: **The key to reaching financial freedom is to focus on strengthening your net worth statement.**

A working definition of 'financial freedom' is enjoying a passive income stream that exceeds all expenses.

The key word in that definition is 'passive'. Eventually, Norlia will want to trade positions with her money: Right now, she works for money; later on, her money should work for her.

But the only way Norlia can achieve that goal is to create the requisite passive income stream. This solution is so obvious that even prior to seeing me, it was probably lurking in the shadows of her subconscious. However, it wasn't ever clearly enunciated and therefore never acted on.

The first step in achieving this commendable goal, is for Norlia to stop 'living like there is no tomorrow' because doing so only generates a pile of unwanted bills.

Norlia needs to learn the crucial lesson of **exercising delayed gratification**. At 34 years of age, it isn't too late for her to learn it. By gradually adjusting her behaviour so that she forgoes some immediate pleasures she will be able to free up a portion of her healthy monthly cash inflows, earned actively at her job, to enhance her overall financial strength. Toward this end, the smartest thing she can currently do is to aggressively target her debts for decimation.

There are two components to any Net Worth statement: the assets and the liabilities. Ultimately, financial freedom will be reached by Norliah's conscious efforts to build up her investment portfolio by gradually purchasing sound investment assets. However, because the typical interest cost of a liability is significantly higher than the interest yield on most saving and investment vehicles, it usually makes sound financial sense to eliminate as much debt as possible, as quickly as possible.

This brand of logic is most readily illustrated by taking a quick look at the various yields of Norliah's assets and the various costs of her liabilities.

The original net worth statement is replicated below with additional information drawn from the key facts and assumptions given in the case study and the supporting spreadsheet-based calculations already carried out above.

<b>NORLIAH'S</b>			<b>NET WORTH STATEMENT</b>		<b>AS AT</b>	<b>TODAY</b>
<b>Assets</b>	<b>RM</b>	<b>Nominal Yield</b>			<b>APR (Annualised Percentage Rate)</b>	
Current account	5,000	0%			0%	
Fixed deposit account	2,000	5% annual average rate			5%	
EPF	200,000	5.5% annual			5.5%	
Condominium (home)	400,000	0%			0%	
Car	145,000	-10%			-10%	
Others	-	n.a.			n.a.	
<b>Total</b>	<b><u>752,000</u></b>				-0.5% (Weighted average yield)	
					1.8% (Weighted average yield without car)	
					5.4% (Weighted average yield without car and condo)	
<b>Liabilities</b>	<b>RM</b>	<b>Nominal Cost</b>			<b>APR (Annualised Percentage Rate)</b>	
Family loans	0	n.a.			n.a.	
Credit Card balance	23,000	1.5% per month			19.7% (based on daily compounding)	
Mortgage	382,195	7.7% nominal annual cost			8.00% (based on daily compounding)	
Car Loan	136,195	6% p.a. simple interest			10.6% (average, based on no prepayments.)	
Others	0	n.a.			n.a.	
<b>Total</b>	<b><u>541,390</u></b>				9.2% (Weighted average cost)	

There are three different weighted average yields calculated for Norliah's assets to take into account various treatments of what actually constitutes an asset. Since her car is deemed (quite subjectively) to be depreciating at 10% a year (moving forward, since the preceding year's depreciation was much higher), it pulls down into negative territory the net yield of her gross asset base.

The condominium is, in this case, deemed (again subjectively) to be merely holding its value and neither appreciating or depreciating.

Moving down the list, the car loan APR (annualised percentage rate) is calculated on the assumption that she does not prepay it. The way hire purchase amortisation tables are constructed in Malaysia, the APR is not the same throughout the payment period, but is highest at the beginning of the loan and lowest at the end.

For instance, the appropriate calculations show that in the first year of Norliah's loan the APR is 12.2%.

In the second year, that APR falls to 11.5%, and so on down until 9.0% in the seventh year of her HP loan.

These calculations are based on a backward looking 12-month rolling window calculation, which first derives the annual nominal interest rate and then calculates the APR using the formula:

$$\text{APR (or EIR)} = \{[1 + (\text{Nominal rate}/\text{number of compounding periods})]^{\text{number of compounding periods}} - 1$$

*[Note: The annual nominal interest rate is calculated by imputing the start and end values of the principal sum outstanding, and assuming a steady nominal interest rate is at work.*

*Number of compounding periods = 12.]*

Since, Norliah clearly does not have the money available to pay off her car loan in full, the assumption that she makes no **prepayments** throughout the remaining 6 years of the loan is adequate for this analysis.

The weighted average interest rate cost of her total debt-load of RM541,390 is 9.3%. This means that her annual interest charge – assuming a static situation with no principal repayments throughout the coming year – is RM541,390 x 9.3% = RM50,349.27. That's more than three months of her new gross salary going toward the mere 'rental' of other people's money!

So clearly, if Norliah wants to increase her chances of achieving financial freedom she should attack her debt situation first, before worrying too much about investing aggressively in appreciating assets.

**Two useful strategies she might want to consider are:**

1. **To target the highest costing loan first** and concentrate any cashflow surplus toward eliminating it. Once that is done, she should focus on the next most expensive loan, and so on down the list.
2. **To target the smallest loan first** and focus all cashflow surpluses toward eliminating that. Then, she should reallocate all the cash that had previously been used on the smallest loan toward the next smallest one.

(Both methods assume that all required minimum payments are made on all outstanding loans so as not to spook those creditors who aren't initially targeted for accelerated prepayment.)

From a strictly mathematical viewpoint, the first strategy is more efficient. This is because it results in the OVERALL interest charge for the following month being smaller than if she were to target the smallest loan without taking into account the interest cost of

that loan. The only exception to this inescapable mathematical truth occurs if both the most expensive and the smallest loan are one and the same.

Interestingly, that is the situation Norliah faces!

However, since financial planning is arguably more art than science, the human element must be taken into consideration when formulating a plan. Consider: It is possible that Norliah is in dire need of being able to see quick progress if she is to stand any real chance of sticking to her debt eradication programme. If that is the case, the second strategy will actually prove more amenable to providing her with a quicker emotional 'boost' through the initially faster elimination of loans.

Now, quite apart from the pros and cons of the methods, the practical limitations Norliah faces must also be taken into account. These limitations fall into two key groups:

1. Her fiscal constraints; and
2. Any prohibitions her creditors might put on her.

If we look again at the three distinct debts in her liability list, we discover that there is no prepayment penalty attached to her paying extra toward her credit card balance. Neither is there any penalty to her prepaying her home mortgage. However, in the case of the car HP loan, under Malaysian norms Norliah does not have the luxury of making a partial prepayment. She either has to continue paying the fixed instalment sum of RM2,536 per month or she needs to repay the car loan in full.

At the start of her second year of car payments, the sum owed is RM136,195. She doesn't have that much ready cash to settle the loan. **Therefore, she has no choice. Regardless of which debt-eradication method she opts for, she will need to focus on prepaying the other two loans first.**

Because the credit card loan is smaller than the outstanding mortgage (RM23,000 versus RM382,195) and also more expensive than the mortgage (an APR of 19.7% versus an APR of 8.0%), she obviously should attempt to pay off her credit card balance as fast as possible.

Once that is done, she may want to consider increasing her mortgage payments by the quantum she was paying toward the credit card each month. However, because of the relatively low cost of the mortgage when compared to potential returns from investments such as well-chosen stocks and unit trusts, she might, perhaps more sensibly, want to channel a portion of the surplus freed up by her victory over her credit card balance toward such investments.

The choice, as always, is ultimately hers.

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Q4. Studies have shown that educators such as teachers and lecturers often make extraordinarily good financial planners. This is due to the educational cum counselling skills needed to ‘manage’ clients’ expectations and to mentor them. You rely greatly upon such innate skills yourself.

- d. Toward that end, in the midst of regular client reviews with Norliah, you make mention of the Rule of 72 and the Rule of 78, in very different contexts.

The Rule of 72 pops up when you’re discussing investment returns and inflation erosion.

You explain the Rule of 78 to Norliah when pointing out the differing effects of her potential decision to sell her car, depending on when she does so. She is contemplating selling it immediately at the start of Year 2 of her HP loan, or a year down the road at the start of Year 3 of her HP loan, or four years from now at the start of Year 6 of her HP loan. Then, work out the APR (annualised percentage rate) of that full 7-year loan – assuming she keeps the car for the full duration of the loan – and explain in qualitative terms only the difference between the official quoted interest rate of 6% p.a. and the calculated APR. Imagine you are having this wide-ranging discussion with Norliah in your office. Elaborate upon the two key uses of the Rule of 72 already mentioned, and then outline the reason the Rule of 78 is used in situations where simple interest rather than compound interest is utilised in principal and interest calculations.

- e. Assume that within just 6 years of working as her financial planner you succeed in guiding Norliah to a position of complete freedom from debt. On her 40<sup>th</sup> birthday, Norliah is still contentedly single. At this time you initiate an aggressive programme of retirement funding that is targeted to complement her EPF savings. Also, note that in the midst of helping her clean up the liability portion of her net worth statement, you raise her cash reserves up to RM100,000. By this time, Norliah’s job position is extremely secure, and her monthly expenses are RM10,000 a month. You decide that a three-month emergency buffer is sufficient for her. (Explain the instruments used as buffer repositories – you may make use of the phrase ‘return of capital NOT return on capital’ in your explanation of choice of asset class or asset vehicle.) Once you have done that, you may ignore the effects of inflation and all subsequent pay increases over the following 15-year period, and assume that Norliah begins her new retirement funding programme IMMEDIATELY (at age 40, in 2008) using as an initial lump sum all of her cash reserves **minus** the buffer amount. By this time, January 1<sup>st</sup> 2008, her monthly cashflow surplus has risen to **RM12,000**. You advise her to utilise a fixed sum of something between 50% and 90% **of that monthly surplus** to add to her new retirement funding programme at the end of each month. If you work out that Norliah requires RM7.8 million to be able to retire comfortably at age 55 when, incidentally, her EPF balance will be RM4.5 million (which assumes no intervening withdrawals):

- i. How much should she invest each month, assuming an 8% nominal annual growth on her portfolio to make up the shortfall from EPF?
- ii. If Norliah invests 60% of her surplus each month, what nominal annual growth rate must she earn to achieve her goal?
- iii. What if she invests only 30% of her surplus, what nominal annual growth rate must she earn to achieve the same goal?

Since Norliah invests her money 12 times a year, work out the effective interest rate or annualised percentage rate (APR) for each of those **three** nominal rates. Put on your educator hat again to first state what the common acronym IRR stands for. Then, explain and define IRR, based on the specified inflows of cash into the portfolio from the beginning of 2008 until the end of 2022, and the targeted cash outflow on January 1<sup>st</sup> 2023. Explain the danger of over-reaching for yield in such a situation – use the following terms – risk, volatility, standard deviation, the Sharpe ratio and beta – in your answer.

- f. Relate your explanation to the need for a blending of asset classes to construct an appropriate portfolio, as a cornerstone of your investment planning approach for Norliah. In your explanation, touch lightly upon each of the following terms: diversification, dollar-cost averaging, portfolio optimisation, the efficient frontier, alpha and correlation. Also, elaborate briefly upon the assertion: SYSTEMATIC RISK IS NON-DIVERSIFIABLE. Then, for EACH of the 30% and 60% of surplus cash scenarios, suggest one appropriate portfolio. Make sure you use the assumptions in ‘additional assumption 6’.
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## SAMPLE ANSWER TO Q4.

### SAMPLE ANSWER TO Q4a.

4a. In my regular financial planning reviews with Norliah I have had reason to refer to both the Rule of 72 and the Rule of 78. Although they sound similar, they are used in markedly different ways.

This is how I explained the Rule of 72 to Norliah:

If you stroll into a high street commercial bank with RM1,000 to deposit, and you notice that the 12-month FD rate is 5%, then assuming that rate stays steady for decades to come, it is understandable for you to assume that it will take  $100\%/5\% = 100/5 = 20$  years to double your money. After all, doubling your money is equivalent to earning 100%.

However, that reasoning is flawed because FD accounts don't pay low-grade simple interest but rather pay its high-octane cousin compound interest. And with compound interest, your interest earned in a preceding period becomes part of the new principal sum at the start of a new period, thus qualifying to earn interest itself.

The effect on the bank balance is much like a snowball growing larger and larger as it rolls down an alpine slope because it sweeps up crushed snowflakes as it trundles over them!

In a similar fashion, because of the favourable impact that compounding has on interest earned (compounding turns interest earned in one period into principal in the next period), it takes LESS than 20 years to double your money if your savings grow at an annualised percentage rate (APR) or effective interest rate (EIR) of 5%. If you do the math, which we will do together in a little while, it actually takes less than 15 years, 14.21 years to be exact, to grow your initial RM1,000 deposit to RM2,000.

Obviously, as the interest rate changes, the amount of time needed to double your money will also change. And logic dictates that there must be some sort of *inverse* relationship at work here. So, the higher the interest rate, the shorter the tenure needed to double your money. And, similarly, the lower the interest rate, the longer it takes to double your savings.

And what logic dictates, mathematics bears out.

The following table shows the time (in years) it takes to double your savings or investments through compound interest based on different interest rates, ranging from 1% a year to 15% a year. This range has been chosen because it is usually impossible to lock in long-term yields that are higher than that. The well-known risk-reward relationship, shown in this chart, states two things.

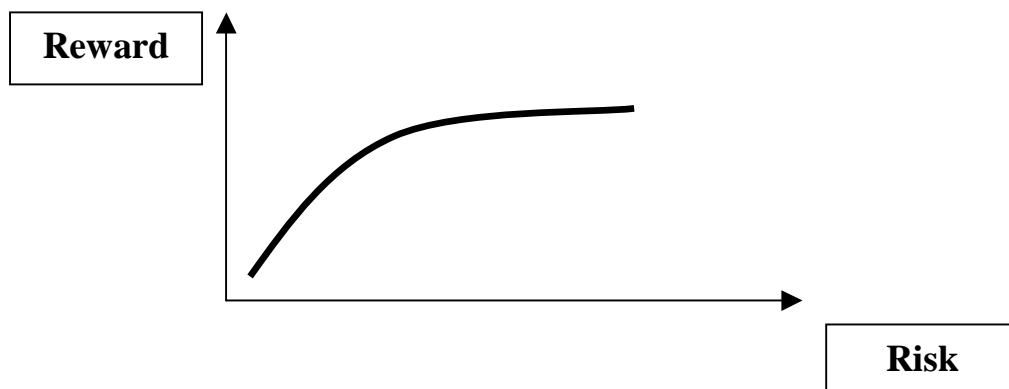
First, the more risk you are willing to stomach, the higher the return you should be able to expect to gain.

Second, beyond a certain risk level, the incremental rewards you can expect to get in the long-term tend to flatten out. There is a point of diminishing returns (quite literally!) where it no longer makes sense to take on significantly more risk for only marginal *potential* improvements in returns.

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## THE RISK-REWARD RELATIONSHIP



And, empirically, it does seem that in the Malaysian context the most realistic range of sustainable positive returns runs up to only about 15%. So, let's see what precise calculations for interest rates ranging from 1% to 15% a year, at one percentage point intervals, show us:

### TIME NEEDED TO DOUBLE YOUR MONEY

Start Value (RM)	Interest Rate of Investment (I%)	Exact Number of Years to double to:	End Value (RM)	Approximate Number of Years (P)	I x P (to the nearest integer)
1,000	1%	69.65	2,000	69.7	70
1,000	2%	35.00	2,000	35.0	70
1,000	3%	23.45	2,000	23.5	70
1,000	4%	17.67	2,000	17.7	71
1,000	5%	14.21	2,000	14.2	71
1,000	6%	11.90	2,000	11.9	71
1,000	7%	10.25	2,000	10.2	72
1,000	8%	9.01	2,000	9.0	72
1,000	9%	8.05	2,000	8.0	72
1,000	10%	7.27	2,000	7.3	73
1,000	11%	6.64	2,000	6.6	73
1,000	12%	6.12	2,000	6.1	73
1,000	13%	5.67	2,000	5.7	74
1,000	14%	5.29	2,000	5.3	74
1,000	15%	4.960	2,000	5.0	74

If you look closely at the numbers in the final column, you'll see that for interest rates in the 'normal' savings and investments range of 1% to 15%, the **AVERAGE product** of the absolute number of the interest rate and the absolute number of years needed to double your money is **72**. And, the spread is remarkably small. In statistical terms, if we crunch all the numbers in that last column as a series, the mean or average is 72 and the standard deviation only 1.5 (using standard statistical software available in Excel or using a financial calculator).

In plain English this means that we can use, quite reliably, the number 72 as an approximate product of interest rate (I) and the time needed to double your money at that interest rate (T).

As formulae, all that would look like:

$$72 = I \times T; I = 72/T; \text{ and } T = 72/I.$$

And that, in a nutshell, is what the Rule of 72 is!

If you want to work out the number of years it takes to double your money at a set interest rate, just take 72 and divide it by the absolute number of the interest rate. And if you want to work out the required interest rate to make sure you manage to double your money in a set number of years, just take 72 and divide it by the absolute number of years.

The same relationship can also be used to help us understand better the true effects of inflation upon our buying power. For instance, the Rule of 72 can be readily used to show that if you want to double your money in 18 years, you need to earn a steady (or compounded average growth rate, CAGR) of  $(72/18)\% = 4\%$ .

Similarly, if we know inflation is running at 4%, we can use the same formula to work out how much, in terms of tomorrow's ringgit, will be needed to have the same amount of buying power. Doing so shows us that if inflation runs at 4% a year, then in  $(72/4)$  years = 18 years you will need RM2 to buy what RM1 can buy today.

In other words, if you assume a long-term inflation rate you can readily use the Rule of 72 to estimate how long it will take your money to lose half its buying power.

Moving on, this is how I explained the Rule of 78 to Norliah:

Although the Rule of 78 sounds very similar to the Rule of 72, it is different. Though, if truth be told, there are actually two versions of the Rule of 78.

The lesser known one actually works precisely like the Rule of 72, except that its best application is for interest rates in the range of (about) 20% to 35%.

The better known version of the Rule of 78 is used when finance companies need to calculate the interest rebate portion of a hire purchase (HP) loan that is about to be prepaid (necessarily, in full).

As an illustrative example, we'll use Norliah's actual car loan and its amortisation table, which was originally calculated as part of the answer for question 2d. The relevant portion of that answer is shown here:

## NORLIAH'S CAR HIRE PURCHASE POSITION (summary):

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Norliah borrows RM150,000  
Nominal Interest rate                      6%  
Loan duration                                  7 years, or 84 months  
Her total term charges come to RM63,000  
Total amount owed if loan is carried to full term = RM213,000  
Cost per month = RM2,536

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[NOTE: The calculations for the car loan will require knowing how finance companies calculate the outstanding sum on an HP loan through the use of this formula:

**Malaysian Hire Purchase (HP) Interest calculation = (Number of months to maturity/sum of all months in loan tenure) x total term charges**

To understand this fully, it is important to replicate Norliah's entire HP amortisation table, which will not be done here in the interests of brevity.]

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So, where does the Rule of 78 come from?

In an HP loan, the entire nominal stated interest rate is charged on the **initial** sum borrowed for the FULL agreed upon tenure of the loan. That's why in Norliah's case, her so-called 6% loan over 7 years has a total interest charge of  $(6\% \times 7) = 42\%$ , which comes to RM63,000.

But, obviously, should Norliah decide to prepay her loan, she **ought, in all fairness**, be entitled to some rebate of interest.

To simplify our understanding of this situation, let's ignore Norliah's current case just for the moment. Instead, let's look at a 6% HP loan of one-year tenure. One year has 12 months, and this seemingly unnecessary detail will prove useful in a little while.

Right at the start of the one-year loan, which is amortised over 12 equal monthly payments, all of the lender's capital commitment to the borrower is in the borrower's 'hands'. As the months progress, less and less capital remains there as money is transferred through equal monthly payments back to the lender.

Under this scenario, to figure out the changing split between the interest component and the principal component of each monthly payment, the lender, say a finance company, uses the **sum-of-digits method of interest apportionment**.

This is the basic idea: In the first month of the loan, the borrower uses 12 times more capital than he does in the final month. In the second month of the loan, the borrower uses 11 times more capital than he does in the final month. In the third month of the loan, the borrower uses 10 times more capital than he does in the final month. And so on, right down to Month 12. By that reckoning, the total interest charged is divided into  $12+11+10+9+8+7+6+5+4+3+2+1 = 78$  (!) parts. And that's why the 'sum-of-digits' method is commonly called the Rule of 78.

That nomenclature remains true even if the loan period is not one year. For instance, if it were a two-year loan, with 24 monthly payments, then  $24+23+22+\dots+3+2+1=300$ . The quick way of working out any sum of digits total is to take half the number of months and multiply it by (one plus the number of months). As a formula that works out to:

$$\text{Sum-of-digits (n months)} = (n/2) \times (n+1) = [n \times (n+1)]/2$$

So, for Norliah's 7-year (or 84-month) car loan, the sum of digits works out to be =  $[84 \times 85]/2 = 3,570$ .

(Therefore, even though Norliah's loan is for 7 years and the sum of digits of that period is **3,570**, by force of convention, the Rule of **78** (the base number of one year of monthly payments) is still said to apply.)

The interest payable in any month equals the number of months to maturity divided by the base number of that tenure. So, for Norliah's loan, the formula to work out the interest payable in any month is:

**Interest in Month m** =  $[(84-m+1)/3,570] \times$  Total Term charges calculated for the original loan =  $[(84-m+1)/3,570] \times \text{RM63,000}$ .

I am told that Norliah is contemplating selling her car at one of three possible times: Immediately at the start of Year 2 of the HP loan ( $m = 13$ ); a year later ( $m = 25$ ); or at the start of Year 6 ( $m = 61$ ). We could use the formula given above to work out the interest payable in any particular month. But that, by itself, would not grant us sufficient information to be of use to Norliah as an aid to her decision making.

Because HP loans can only be prepaid in FULL, it would be useful to refer now to a spreadsheet showing the calculations for every month of Norliah's contracted for tenure. Unfortunately, that spreadsheet (internally referred to by the FPAM as **SUPPORTING 2d CAR HP.xls**) is too large to show here.

Still, from that spreadsheet, we see that at:

$m = 13$ , RM136,195 is owed prior to that month's instalment payment of RM2,536 and RM134,930 is owed after the instalment.

$m = 25$ , RM119,849 is owed prior to that month's instalment payment of RM2,536 and RM118,372 is owed after the instalment.

$m = 61$ , RM55,563 is owed prior to that month's instalment payment of RM2,536 and RM53,451 is owed after the instalment.

**Because of the very, very heavy front-end loading of Norliah's loan (84/3,570 in the first month, 83/3,570 in the second month, and so on) prepayment (in full) of an HP loan is best done AS NEAR THE BEGINNING OF THE LOAN AS POSSIBLE.**

If we try to work out an approximate value for the APR of the loan in the first year, that comes to about 12.2%. The APR of just the second year comes to 11.5%, and so on down to 9% for the final year. But those values are for single years. We need to carry out a different calculation to work out the equivalent APR of the entire loan over its full 7-year tenure.

Remember that Norliah DOES NOT have the cash upfront to pay off her loan in full. Furthermore, since her financial situation is such that I – as her financial planner – will certainly *attempt* to dissuade her from trading in her already partially depreciated car for an even more new (and thus not yet depreciated) expensive vehicle, I will assume that she maintains her car for the full seven years it takes to pay off the loan.

If she does that, then it is a relatively straightforward exercise working out the APR (or EIR) of that full 7-year loan. This is most easily done with a financial calculator, based on the following inputs:

12 payments a year

$N =$  number of months of payments = 84

$PV =$  present value or initial sum Norliah borrowed = RM150,000

$PMT =$  monthly instalment sum = - RM2,536

$FV = 0$

MODE = END, since car payments typically are made at the end of each month.

Solve first for nominal interest rate = 10.5882%.

But what's required is the APR, so the next stage requires that the nominal interest rate be input as such. Conditions remain as 12 payments a year, at the END of each month. That works out an **APR or EIR = 11.1174% or about 11.1%**.

There is clearly a huge difference between the official quoted rate of 6% p.a. and the calculated APR of 11.1%. (Note that this figure is a little higher than the **arithmetic average** of the various APRs used above in the answer to Question 3, which was 10.6%.)

The APR of 11.1% is almost double the nominal rate of 6%. If you stop and think about it, that makes sense. After all, the nominal quoted rate is used to work out the entire interest rate charged over the period, as though the full principal sum were not being repaid gradually. However, in truth, the principal outstanding does vary.

At the start of the loan, the full RM150,000 was outstanding. At the end of the loan, RM0 was outstanding.

Very approximately, it is easy to see that *the average principal sum outstanding* throughout that loan must have been *about* halfway between RM0 and RM150,000. **Because the average principal sum was about half of RM150,000 (= RM75,000), then based on the total interest charged, it must be that the actual interest being charged is about double the quoted rate.**

Such situations always arise when the Rule of 78 comes into play. The reason the Rule of 78 is used in simple interest calculations is that the methodology is suited to situations where the total interest charged is pre-computed and fixed throughout the tenure of the loan.

But with our ready access to computing and calculating power, the much more equitable and transparent compound interest basis is TODAY's norm. It thus seems possible that this historical holdover used by finance companies to rake in huge amounts of interest from a largely unsophisticated clientele will soon fade away.

*(Additional detail: If the 85 different principal amounts, starting with RM150,000 when  $m = 0$ , and ending with RM0 when  $m = 84$ , are summed and then divided by 85, it turns out that the average principal sum is RM85,253. That amount is close enough to the RM75,000 used in the wholly qualitative explanation above to justify the approximation. But interestingly, if a linear interpolation is then carried out, using RM150,000 linked to 6%, and RM75,000 linked to 12%, it leads to an estimated APR of 11.2%, which is hearteningly close to the actual calculated APR of 11.1%.)*

#### SAMPLE ANSWER TO Q4b.

4b. From the information in the case study, we know that Norliah was born on January 1<sup>st</sup> 1968. Therefore, she celebrates her 40<sup>th</sup> birthday on New Year's Day 2008. At that point, we are told that:

1. Norliah is completely debt-free;
2. She is happily single;
3. Her cash reserves amount to RM100,000;
4. Her job is secure;
5. Her monthly expenses average RM10,000.

Since her job is secure, an emergency buffer amounting to three months' expenses is sufficient for her. That comes to RM30,000.

That money should be 'storm-celled' in safe, liquid savings vehicles such as bank savings accounts, bank fixed deposits and secure, low-risk bond funds, and (only because Norliah is a bumiputera) perhaps Amanah Saham Bumiputera (ASB) units. While the yields from the first three vehicles aren't terribly high, typically ranging (in 2002, at least, although this exercise relates to early 2008) from 1% p.a. to perhaps 5% p.a., high returns are NOT the issue. (Admittedly, ASB has provided excellent returns annual returns of the order of 10% p.a. for many years. But we'll deal with that shortly.)

What must first be understood is that the most crucial consideration for Norliah is that in the event of an emergency arising that necessitates easy access to money, she is able to get her hands quickly on ALL her emergency cash. As such, the key requirement of her emergency buffer is that the capital be preserved at all times. Therefore, in this instance, Norliah is not concerned with attaining the highest possible yield. Thankfully, ASB units – assuming they are still capital-guaranteed at RM1 in 2008 – meet the requirement for capital preservation while yielding great returns.

Norliah should use 'return of capital NOT return on capital' as the key criterion in selecting her emergency buffer repositories.

Now, let's return to what is known about Norliah's situation on turning 40. To reiterate the first five points and building on from there:

1. *Norliah is completely debt-free;*
2. *She is happily single;*
3. *Her cash reserves amount to RM100,000;*
4. *Her job is secure;*
5. *Her monthly expenses average RM10,000;*
6. Her emergency buffer should amount to RM30,000, thus bringing her unutilised cash reserves (see point 3.) to RM70,000;
7. Based on the conditions set forth in the question, I am to IGNORE the effects of inflation and all subsequent pay increases for Norliah;

8. She is to begin her new retirement funding programme IMMEDIATELY, at age 40, in January 2008;
9. She does so using the unutilised cash reserves of **RM70,000** (see point 6.) as an initial lump sum investment;
10. At this point, Norliah's monthly cashflow surplus is RM12,000;
11. My general advice to her, therefore, is to utilise a **FIXED MONTHLY SUM** to invest, chosen between 50% and 90% of that monthly cashflow surplus. Therefore, the relevant range for her fixed monthly investment is from **RM6,000 to RM10,800**;
12. Since the question states, as a given, that I have already worked out that Norliah requires RM7.8 million to be able to retire comfortably at 55, the **key consideration is the funding gap**. Norliah's projected EPF balance is RM4.5 million (assuming no intervening withdrawals), so **the funding gap is RM7.8 million minus RM4.5 million = RM3.3 million**.

4b(i). Assuming Norliah's retirement top-up portfolio earns a nominal 8% each year, between January 2008 and December 2022, the following steps need to be taken to calculate – using a financial calculator – the required monthly investment amount. Required inputs:

12 payments a year

Nominal interest rate = 8%

N = number of months of payments =  $12 \times 15 = 180$

PV = present value or initial sum Norliah invests = -RM70,000 (from point 9.)

FV = RM3.3 million (from point 12.)

MODE = END, since she is likely to make her monthly investments at the end of each month when her salary is paid

Solve for PMT = **monthly investment sum = -RM8,867.56** or rounded up to **RM8,900**.

So, based on the assumptions made in part (i), Norliah needs to invest about RM8,900 each month to make up her projected EPF shortfall.

4b(ii). Assuming Norliah's invests 60% of her surplus each month, between January 2008 and December 2022, the following steps need to be taken to calculate – using a financial calculator – the required nominal annual growth rate. Required inputs:

12 payments a year

N = number of months of payments =  $12 \times 15 = 180$

PV = present value or initial sum Norliah invests = -RM70,000 (from point 9.)

PMT = monthly investment amount = 60% of RM12,000 = -RM7,200

FV = RM3.3 million (from point 12.)

MODE = END, since she is likely to make her monthly investments at the end of each month when her salary is paid

Solve for **nominal annual growth rate = 10.0%** (to one decimal place).

So, based on the assumptions made in part (ii), Norliah needs to earn a nominal 10.0% a year to make up her projected EPF shortfall.

4b(iii). Assuming Norliah's invests ONLY 30% of her surplus each month, between January 2008 and December 2022, the following steps need to be taken to calculate – using a financial calculator – the required nominal annual growth rate. Required inputs:

12 payments a year

$N = \text{number of months of payments} = 12 \times 15 = 180$

$PV = \text{present value or initial sum Norliah invests} = -\text{RM}70,000$  (from point 9.)

$PMT = \text{monthly investment amount} = 30\% \text{ of RM}12,000 = -\text{RM}3,600$

$FV = \text{RM}3.3 \text{ million}$  (from point 12.)

MODE = END, since she is likely to make her monthly investments at the end of each month when her salary is paid

Solve for **nominal annual growth rate = 15.7%** (to one decimal place).

So, based on the assumptions made in part (iii), Norliah needs to earn a nominal 15.7% a year to make up her projected EPF shortfall.

Based on the information given and the calculations carried out above, the relevant nominal interest rates are:

- (i) 8%; (ii) 10.0%; (iii) 15.7%.

Using END MODE and 12 payments a year, a financial calculator can be used to readily work out the respective APRs (or EIRs), which are:

For a nominal 8%, the **APR = 8.3%**;

For a nominal 10.0%, the **APR = 10.47%** or about **10.5%**;

For a nominal 15.7%, the **APR = 16.88%** or about **16.9%**.

In the course of my regular reviews with Norliah, I inadvertently used the acronym IRR, without explaining what it meant. When she asked me, I quickly realised my mistake in assuming my clients are necessarily as clued on about financial terms as I am through the arduous Certified Financial Planner (CFP) course of study I have completed. Apologising, I then told Norliah that **IRR stands for Internal Rate of Return**.

That verbal expansion of the acronym only served to confuse her further, so I elaborated using her own projected situation of a series of cash outflows INTO her portfolio, beginning with –RM70,000 at the start (Month 0), the specified fixed monthly outflow (from Month 1 through to Month 180) and a huge payout (or cash inflow for her) of RM3.3 million in January 2023 (deemed Month 181):

**In any series of cashflows, that includes at least one cash inflow and at least one cash outflow, the IRR or internal rate of return, is the discount rate that generates a net present value (NPV) of zero.**

**And the net present value (NPV) is the cumulative present value (PV) of a series of cash inflows minus the PV of a series of cash outflows, with both those PVs adjusted by an appropriate interest rate usually called the discount rate.**

The general rule is that once an IRR is worked out, the investor (Norliah, in this case, but it applies equally well to a business or company that is considering the viability of a potential project) needs to see if that IRR value is higher than her (his or its) cost of capital. If it is higher, then the project is viable. And if the IRR value is lower than the cost of capital, the project is not viable.

Because Norliah is now debt-free, her cost of capital should be taken to mean merely the opportunity cost of some other investment option. In such situations, the usual base level hurdle that Malaysian retail investors need to look at is the closest thing to a risk-free rate, which is generally taken to be Maybank's 1-month FD rate (currently in the 3% to 3.5% p.a. range).

In the three situations given above, a financial calculator can be set up to calculate the appropriate IRRs.

i. For a nominal 8%, the **APR = 8.3%**:

Cashflow (Cf) 0 = -RM70,000  
Cf 1 to Cf 180 = -RM8,900  
Cf 181 = RM3.3 million

IRR = 7.9% (note the difference between this and the nominal interest rate assumed of 8% is caused by the monthly investments of RM8,900 having been rounded up from the original calculated value of RM8,867.56.)

ii. For a nominal 10.0%, the **APR = 10.5%**:

Cashflow (Cf) 0 = -RM70,000  
Cf 1 to Cf 180 = -RM7,200  
Cf 181 = RM3.3 million

IRR = 9.9% (note the difference between this and the nominal interest rate assumed of 10% is caused by rounding.)

iii. For a nominal 15.7%, the **APR = 16.9%**:

Cashflow (Cf) 0 = -RM70,000  
Cf 1 to Cf 180 = -RM3,600  
Cf 181 = RM3.3 million

IRR = 15.6% (note the difference between this and the nominal interest rate assumed of 15.7% is caused by rounding.)

All these calculations suggest that Norliah is faced with a choice of whether to invest her RM70,000 as an initial lump sum and then continue investing a large chunk of each month's surplus, and only require a relatively low CAGR to reach her goal, or to invest the same amount as an initial lump sum and then a small chunk of each month's surplus, but then require a relatively high CAGR to reach her goal.

This is the trade-off. Because of the risk-reward relationship, Norliah will need to take on more **risk** if she wants more of a reward, in relative terms. If she is willing to exercise a lot of delayed gratification, this means that she will be willing to give up the chance to spend *most* of her monthly surplus on creature comforts to increase the chance of her achieving her financial goal of full retirement funding.

You see, if she invests a lot of money, say RM8,900 a month, instead of RM3,600 a month, then she only needs to lock in a portfolio that generates a blended yield of about 8% instead of almost 16%, to achieve her target.

The advantage of investing more and needing a much lower portfolio CAGR is the markedly reduced **volatility** of her portfolio. This means that if the up and down movements of her portfolio are tracked over time, the less risky, less volatile portfolio will have a lower **standard deviation**.

According to the excellent research and theoretical framing carried out by Nobel laureate William F. Sharpe, it is possible to use a ratio – called the **Sharpe ratio** – to rank a series of investments in terms of relative attractiveness. An investment that generates say X units of reward by taking Y units of risk is clearly twice as attractive as another investment that also generates X units of risk but takes 2Y units of risk to do so. (The benchmark for these ratio calculations is the risk-free rate available in any market.)

Within the Malaysian context, attempts to over-reach for yield often result in portfolio implosion. With my help, Norliah should be able to vet through a series of investments ranked by the Sharpe ratio to help her determine an optimal portfolio selection.

In such a process, the use of an investment's **beta** value can also prove profitable. Beta represents the volatility of an investment relative to an appropriate index. For instance, an equity unit trust fund may have a beta value relative to the Kuala Lumpur Composite Index (KLCI) of 0.6, while a stock may have a beta value, again relative to the KLCI, of 1.1. The beta value is a measure of non-diversifiable systematic risk. In simple terms, this means that if the CI were to rise by 50%, the unit trust fund with a beta of 0.6 can be expected to rise by  $0.6 \times 50\% = 30\%$ . The stock, on the other hand, by virtue of its 1.1 beta, can be expected to rise by  $1.1 \times 50\%$  or 55%.

On that basis, the stock looks far more attractive. But the full picture needs to be looked at. For when the market softens and the CI, say, drops by 70%, the fund can be expected to drop by only 42% compared to the stock's expected 77% nosedive.

In the final analysis, the amount of risk that Norliah can stomach will need to be carefully taken into account – perhaps through a combination of discussion and actual testing using a risk profile quiz – before an appropriate asset allocation programme can be put together to help her achieve her RM3.3 million personal retirement funding goal.

SAMPLE ANSWER TO Q4c.

4c. **Diversification** within the context of investment science boils down to adhering to the ancient adage: “Don’t put all your eggs in one basket!” A more formal definition goes:

**... In investment terms [diversification] translates into spreading your investment dollars between different classes of investment like common stocks, bonds, real estate and collectibles. Also, within each class of investment spreading your largess around to different specific investments makes for good insurance against the vagaries of economics that may strike any industry at any time.**

[Source: *You’re A-Z Guide to the Stock Market – And all you need to know about capital terms*, pg. 61, Rajen Devadason, (Times Books International 1997)]

The key idea in that investment glossary definition is that spreading your ‘largess’ or money among different investments grants some level of ‘insurance’ against the uncertainties of our economic environment. Figuring out precisely how to go about doing so moves us from the general concept of diversification to the more precise realm of asset allocation.

Two of the three different CAGR rates ‘required’ by Norlia in (4b.) should be achievable using different, appropriately designed, asset allocation models. Why this is so is elegantly explained by the authors of *Diversify your way to Wealth – How to customize your investment portfolio to protect and build your net-worth*:

**Institutional money managers and financial researchers in the “halls of ivy” have been aware of the virtues of asset allocation for years. Simply put, asset allocation requires splitting up investments among several different types of asset classes, such as U.S. stocks and real estate. A portfolio is based on how much risk a person is willing to take or how much a person can lose in any given year without losing a good night’s sleep. Asset allocation works because the returns among assets are uncorrelated, that is, while the returns from one asset class may be decreasing, the returns from others may be increasing. As a result, asset-allocated portfolios contain less price-performance variability or risk than those that concentrate in a single category of assets such as stocks.**

[Source: *Diversify your way to Wealth – How to customize your investment portfolio to protect and build your net-worth*, pg. xvii, Gerald W. Peritt and Alan Lavine, (Heinemann Asia 1994)]

To use the terminology of the question itself, there is a need for ‘a blending of asset classes’ when constructing portfolios. This is the case simply because different risk profiles – and, generally speaking, different time horizons – give rise to different portfolio compositions, which in turn generate different portfolio return rates. In cooking parlance, this means that the quantity and even choice of different ingredients must be adjusted based on the required meal!

Norliah's investment time horizon is relatively lengthy. Fifteen years, as she ages from 40 to 55, is long enough for a portfolio that is heavy in 'risky' assets, such as equity unit trusts and direct stocks, to yield healthy growth. But for safety's sake, Norliah's chosen portfolio should be one that is intelligently put together based on the principle of **diversification** that hinges on the utilisation of an appropriate asset allocation model.

In the words of Peritt and Lavine, "**Asset allocation works because the returns among assets are uncorrelated...**"

Actually, in the real world of investing it is difficult to find totally uncorrelated assets (which in statistical jargon means each pair of such assets has a correlation coefficient = 0). Certainly, in the Malaysian context it is especially hard to find such asset classes. The best we can hope to do is choose from across the range of all assets available to us, on the assumption that each relative **correlation** is low (that is closer to 0 than to 1). For the purposes of this exercise, I shall limit the choice of asset classes and asset vehicles for Norliah's portfolio to those explicitly mentioned in 'additional assumption 6, from the case study, which is replicated here for ease of reference.

ADDITIONAL ASSUMPTION 6:

**Long-term rates of return for well-chosen direct stock investments can be assumed to range from 10% to 15%, with tremendous short- and medium-term volatility. Long-term rates of return for equity unit trusts can be assumed to be 12% p.a. BEFORE average annual expenses of 1.5%; to simplify calculations here, ignore the front-end load – however, be aware that the impact of loads must be taken into account in real life client situations. Assume bond funds yield 8% p.a. before average annual expenses of 0.75%; again, ignore the impact of possible loads. Assume FD rates average 5% over the next 20 years.**

So, our choice of portfolio components will be made from direct stock investments, equity unit trusts, bond funds and fixed deposits (FDs) only. Even though our selection is limited to just three asset classes (equities, bonds and cash) extending across the four different vehicles, thankfully there is very low **correlation** between what I'll refer to as group A assets and group B assets.

Group A assets: 'risky' but high-yielding (in the long run) direct stock investments and 'somewhat less risky' equity unit trusts; and

Group B assets: 'safe' but low-yielding (in the long run) cash held in banks (generally understood to be backed by Bank Negara) and 'reasonably safe' bonds that are generally interest rate sensitive (if traded before maturity, but not if held till maturity barring a bond-issuer default).

The mixing of group A and group B assets means that during the course of Norliah's 15-year investment timeframe, her group B assets will be in a position to provide stability and some measure of consistent growth when the group A assets nosedive during stock market downturns. Conversely, during market upturns her group A assets will generate

healthy portfolio returns to spice up the otherwise lacklustre growth associated with group B assets.

The synchronicity between group A assets and the general stock market, as measured by the Kuala Lumpur Composite Index (KLCI), is inevitable. However, the degree of synchronisation varies with each stock and each equity unit trust. This relationship has already been explained in the definition of 'beta' (see answer to 4b.) But to recap: "Beta represents the volatility of an investment relative to an appropriate index. For instance, an equity unit trust fund may have a beta value relative to the Kuala Lumpur Composite Index (KLCI) of 0.6, while a stock may have a beta value, again relative to the KLCI, of 1.1. The beta value is a measure of **non-diversifiable systematic risk**. In simple terms, this means that if the CI were to rise by 50%, the unit trust fund with a beta of 0.6 can be expected to rise by  $0.6 \times 50\% = 30\%$ . The stock, on the other hand, by virtue of its 1.1 beta, can be expected to rise by  $1.1 \times 50\%$  or 55%."

The beta value is a measure of systematic risk. A formal definition of systematic risk is:

**(T)he part of an asset's variance attributable to the overall market fluctuation; the risk related to overall movements in the market.**

[Source: *Introduction to Investments*, pg. 965, Haim Levy, (South-Western College Publishing 1996)]

And, in simple language, an asset's variance is a measurement of risk that involves seeing just how far from the mean or average value the asset's price tends to move; in this regard.

So, systematic risk is that portion of an asset's volatility that is caused purely because the asset forms part of the market. And for as long as that remains the case, effectively always, **systematic risk, which is also called market risk, is non-diversifiable**. At the heart of this assertion is a most logical reason: As long as we are talking about a single market that contains the whole universe of possible investment choices, then that market contains all risky assets. That means there are no more risky assets outside the market to use as diversification tools.

According to page 69 of *The Portable MBA in Investment* (edited by Peter L. Bernstein, published by John Wiley & Sons, Inc, 1995): "The only way to avoid systematic risk in a specific asset is not to own the asset, and the only way to avoid all systematic risk is to own no risky assets at all."

Incidentally, the total risk of an asset is encompassed in its systematic (market) risk and its unsystematic risk, which is asset-specific.

When you look at the performance of any asset, there are two key components: its average return over time (reward) and the volatility (risk) associated with that asset, hence we have the risk-reward relationship. By tweaking the ratio between assets within a portfolio, the overall risk of a portfolio may be altered. That fact lies at the heart of the groundbreaking work carried out by Harry Markowitz in his Efficient Market Theory

(EMT). Whether or not one believes entirely in the theory, a key component of it, the efficient portfolio, is worth understanding.

An efficient portfolio is one that generates the highest expected return with the lowest expected volatility. For a given menu of assets, **portfolio optimisation** is the process of getting as close as possible to an efficient portfolio. And a related term, the **efficient frontier**, simply refers to the all-encompassing set of investment strategies (or asset allocations) that generate the highest mean (return) for any given variance (volatility or risk).

Not everyone buys into the EMT because of its assertion that better-than-market returns cannot be harvested from the market over the long haul. Indeed, the stupendous long-term performances of investors like Warren Buffett and George Soros prove either that the EMT does not apply in all cases or that markets aren't as efficient as pundits would like to believe. In any case, even investment gurus devoted to proving the validity of the EMT actually use a term, **alpha**, to describe an asset's expected return that is *above* the market consensus!

The long-term goal of serious investors is to beat the market at its own game. This boils down to trying to squeeze out as much excess 'alpha' from it as possible. In an inefficient market like Malaysia – meaning all information is NOT immediately disseminated equally to all market players – it is easier to reap a rich alpha harvest than it would be in a mature, more efficient market like the US.

But, by definition, even in Malaysia NOTHING can be done to eliminate systematic risk. And since it is non-diversifiable, the most proactive thing an investor can do is to try and figure out a way to take advantage of that inherent risk that is embedded into his asset. If we were to take the example of an equity unit trust fund, it is easy to see how the non-diversifiable attribute of market or systematic risk can be turned into a huge plus point.

To do that, let's assume Norliah decides to invest, say, RM100 each month in an equity unit trust fund using the **dollar-cost averaging strategy**. We'll call her chosen investment vehicle Fund A, and we'll assume it has a beta value of 0.6%. The fund starts the year costing 60 sen, when the CI is at 600 points.

For ease of explanation, we'll ignore all possible entry and exit loads. As mentioned, the CI starts the year at 600 points. It then soars and dives in frenetic fashion. In the ensuing months, it rises to 1,200 points, falls to 300 points, rises again to 900 points, falls again to 100 points and then recovers dramatically to end the year at 600 points again.

**THE RESULTS OF NORLIAH'S HYPOTHETICAL FORAY INTO DOLLAR-COST AVERAGING (Fund's beta = 0.6)**

Month	CI (points)	Fund A's price (sen)	Amount invested (RM)	Units bought
1	600	60.0	100.00	166.67
2	800	72.0	100.00	138.89
3	1200	93.6	100.00	106.84
4	700	70.2	100.00	142.45
5	300	46.1	100.00	216.77
6	700	83.0	100.00	120.43
7	900	97.3	100.00	102.81
8	500	71.3	100.00	140.19
9	100	37.1	100.00	269.59
10	200	59.3	100.00	168.50
11	400	95.0	100.00	105.31
12	600	123.4	100.00	81.01
TOTAL			1,200.00	1,759.45
Average price paid for the units = RM			0.6820	
Value of portfolio at year end = RM			2,171.95	
Total cost to buy those units = RM			1,200.00	
Profit = RM & %			971.95	81%

Note that if we compare the start and end of the year, the market didn't move at all. The CI started and ended the year at 600 points. But because of the way the theoretical beta works, the unit trust investment did exceptionally well. The absolute price rose from 60 sen to 123.4 sen. Almost 106%. (In real life, such performances are rarely seen, sadly.) But more interestingly, Norliah's consistent dollar-cost averaging programme resulted in her gaining from the price fluctuations.

If we run the same example again, but this time with Norliah's fund exhibiting a beta value of 1.0, we can see what gains come purely from the discipline inherent in this investment strategy:

**THE RESULTS OF NORLIAH'S HYPOTHETICAL FORAY INTO DOLLAR-COST AVERAGING (Fund's beta = 1.0)**

Month	CI (points)	Fund A's price (sen)	Amount invested (RM)	Units bought
1	600	60.0	100.00	166.67
2	800	80.0	100.00	125.00
3	1200	120.0	100.00	83.33
4	700	70.0	100.00	142.86
5	300	30.0	100.00	333.33
6	700	70.0	100.00	142.86
7	900	90.0	100.00	111.11
8	500	50.0	100.00	200.00
9	100	10.0	100.00	1,000.00
10	200	20.0	100.00	500.00
11	400	40.0	100.00	250.00
12	600	60.0	100.00	166.67
TOTAL			1,200.00	3,221.83
Average price paid for the units = RM			0.3725	
Value of portfolio at year end = RM			1,933.10	
Total cost to buy those units = RM			1,200.00	
Profit = RM & %			733.10	61%

In this instance, with the fund price perfectly tracking the CI, Norliah's gains come to RM733.10 or 61%. Although that's a lot less than the previous example's yield, with the market itself yielding zero or flat results, a 61% gain represents some serious excess returns derived purely from this excellent volatility-exploiting investment strategy.

Dollar-cost averaging works on the basic premise that the lower the investment price falls, the more units you pick up (thus making you relatively more bullish in a bearish environment). And, conversely, the higher the investment price rises, the fewer units you buy (again allowing you to run counter to the prevailing market sentiment).

The net result is controlled, unemotional contrarian-type behaviour.

Over the long haul, if Norliah methodically invests equal amounts of money, at equal time intervals, regardless of market conditions, the discipline inherent in a dollar-cost averaging programme can be expected to generate healthy returns.

The most important point to understand is that Norliah will benefit from a programme of consistent monthly savings and investments. Our cursory look at portfolio construction theory above pointed out the two components to any asset's return pattern – the average return and the volatility experienced to get it.

But the information provided in the case study, under 'Additional Assumption 6' only provides the average return for each asset class, with no indication of intermediate

volatility. As such, the construction of the following two portfolios will necessarily be simplistic.

**ASSUMPTIONS:**

Well-chosen direct **stock** investments: 10% to 15%; use an average annual yield of **12.5%**;

**Equity unit trusts:** 12% before 1.5% annual expenses; use **10.5%** a year;

**Bond funds:** 8% before 0.75% annual expenses; use **7.25%** a year;

**FDs:** 5%.

(Note to reader: These yields should be looked upon as APRs or EIRs NOT nominal rates.)

**NORLIAH'S 30% MONTHLY CASH SURPLUS SCENARIO**

Based on the calculations in the answer to 4b., this scenario requires a portfolio APR of about **16.9%**.

Calculating the required weights with a calculator would be tedious. Using a spreadsheet makes the work simpler:

TARGET APR = 16.9%

Lowest possible APR = 5.0%

Asset	Annual Yield	Portfolio Weighting	Contribution to Annual Portfolio Yield
Stocks	12.50%	0%	0.00%
Equity unit trusts	10.50%	0%	0.00%
Bond funds	7.25%	0%	0.00%
FDs	5.00%	100%	5.00%
		100%	5.00%

Highest possible APR = 12.5%

Asset	Annual Yield	Portfolio Weighting	Contribution to Annual Portfolio Yield
Stocks	12.50%	100%	12.50%
Equity unit trusts	10.50%	0%	0.00%
Bond funds	7.25%	0%	0.00%
FDs	5.00%	0%	0.00%
		100%	12.50%

**Conclusion: Norliah CANNOT achieve her target retirement top-up sum of RM3.3 million if she only sets aside 30% of her monthly surplus since even a full (100%) weighting of the highest yielding asset only grants her a portfolio yield of 12.5%.**

## NORLIAH'S 60% MONTHLY CASH SURPLUS SCENARIO

Based on calculations in the answer to 4b., this scenario requires a portfolio APR of about **10.5%**.

TARGET APR = 10.5%

Lowest possible APR = 5.0%

Asset	Annual Yield	Portfolio Weighting	Contribution to Annual Portfolio Yield
Stocks	12.50%	0%	0.00%
Equity unit trusts	10.50%	0%	0.00%
Bond funds	7.25%	0%	0.00%
FDs	5.00%	100%	5.00%
		100%	5.00%

Highest possible APR = 12.5%

Asset	Annual Yield	Portfolio Weighting	Contribution to Annual Portfolio Yield
Stocks	12.50%	100%	12.50%
Equity unit trusts	10.50%	0%	0.00%
Bond funds	7.25%	0%	0.00%
FDs	5.00%	0%	0.00%
		100%	12.50%

Since Norliah's target APR lies between the lowest and highest possible ones, our task is possible. Specifically, for her to achieve her TARGET APR = 10.5%, she can choose from an infinite array of possibilities. Three of these would be:

A)

Asset	Annual Yield	Portfolio Weighting	Contribution to Annual Portfolio Yield
Stocks	12.50%	0%	0.00%
Equity unit trusts	10.50%	100%	10.50%
Bond funds	7.25%	0%	0.00%
FDs	5.00%	0%	0.00%
		100%	<b>10.50%</b>

B)

Asset	Annual Yield	Portfolio Weighting	Contribution to Annual Portfolio Yield
Stocks	12.50%	59.4%	7.43%
Equity unit trusts	10.50%	13.5%	1.42%
Bond funds	7.25%	13.5%	0.98%
FDs	5.00%	13.5%	0.68%
		100%	<b>10.50%</b>

C)

Asset	Annual Yield	Portfolio Weighting	Contribution to Annual Portfolio Yield
Stocks	12.50%	20.4%	2.55%
Equity unit trusts	10.50%	68.0%	7.14%
Bond funds	7.25%	10.2%	0.74%
FDs	5.00%	1.4%	0.07%
		100%	<b>10.50%</b>

**Conclusion: Norliah CAN achieve her target if she only sets aside 60% of her monthly surplus. She actually has a choice of an infinite number of possible asset allocations. Of the three shown here, a visual inspection suggests strongly that portfolio C is the best one.**

**Reasons: It has at least some representation across all four asset vehicles, and its direct stock exposure is moderate.**

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Q5. Since Norliah is a Muslim, the issue of FARAID is relevant to her circumstances.

- g. Briefly define what FARAID means – you need only touch upon the subject in conceptual terms; there is no need to go into an excessive analysis of its application. However, to help illustrate your conceptual answer you may consider this hypothetical scenario: Norliah writes a Will and specifies that her Buddhist friend Melanie Chong is to inherit Norliah's car. Melanie doesn't really need another vehicle, but she is deeply touched that Norliah thought enough about their relationship to bequeath something so substantial to her. But, quite predictably, Norliah's father Ahmad disputes that clause of Norliah's Will! What happens to Norliah's bequest?
- h. Under Syariah law, only a portion of a deceased Muslim's estate may be disposed of through a Will. What is that portion, in fractional terms? Under what specific circumstances may that proportion rise above that fractional ceiling? What does this mean in regard to Norliah's wish to exclude her relatives from inheriting anything from her?
- i. There are 12 relatives entitled to Syariah distribution of the remainder of a Muslim's estate NOT ALREADY distributed in line with the dictates of a legally established, uncontested Will. Name them. Then, discuss the issue that relates to the preferential position of three out of 15 possible categories of male heirs. Also, discuss the preferential position of five out of 10 possible categories of female heirs. (THIS IS AN EXTREMELY COMPLEX DISTRIBUTION ISSUE, SO STAY FOCUSED ON ONLY ANSWERING THE QUESTIONS ASKED.)

SAMPLE ANSWER TO Q5.

SAMPLE ANSWER TO Q5a.

5a. FARAID is a word that every Malaysian financial planner – regardless of the ethnic profile of his client base – ought to recognise and understand. The word is derived from Arabic, and, in general, refers to *the religious obligations of a Muslim*.

**In the context of Syariah law, FARAID specifically relates to the division of intestate property of a Muslim in accordance with that Islamic code.** This division of intestate property has a markedly different meaning in the Syariah context than it does in normal, general Malaysian usage. For non-Muslims in Malaysia, and indeed throughout the world, the word ‘intestate’ refers to the ‘state of the estate’ of someone who has died without leaving a valid Will.

However, under Syariah law a Muslim is only allowed to will away a fraction of his or her estate (that fraction is up to one-third, which ties in with the answer required in 5b.).

Therefore, in the case of a Muslim (at least in Malaysia, under the current legal framework, which places Syariah considerations, when applied to Muslims, above that of the normal secular legal code) the term ‘intestate’ can have TWO mutually exclusive meanings:

1. The *entire* estate left behind by a Muslim who never wrote a valid Will; or
2. The larger *residual* portion of that estate (which at a minimum constitutes two-thirds of the total estate) that does not come under the distribution dictates of a Muslim’s valid Will.

In either situation, FARAID dictates that all funeral expenses and debts of the deceased be paid out by the estate first, before distribution begins to the heirs specified NOT by the deceased but by the Syariah law code. As such, **there are three categories of people precluded from inheriting anything under FARAID.** These three groups are:

1. Serfs;
2. In the case of the deceased being intentionally killed, those convicted of his murder; and
3. Non-Muslims.

However, do note that in the case of a deceased Muslim who did indeed write a Will – situation 2, above – it seems that the preclusion of the three groups here can be overcome if there is unanimous consent on the part of the living relatives who are to receive inheritances under FARAID.

In the event of a Muslim dying intestate without leaving any lawful heirs then, under the extensive reach of Syariah, FARAID dictates that his or her movable property reverts to

the Bait-ul-Mal (funds of the Majlis Ugama) and non-movable property, namely land, is transferred to the relevant State Land Authority.

But when a Muslim does Will away a small portion of his or her estate, by definition, using a Will to do so, it is generally understood to mean that this Willing away is made to non-blood relatives.

So, if Norliah chooses to bequeath her car to her Buddhist friend Melanie Chong then under the concept equity (meaning here just fairness, not ownership!) she should be allowed to do so. But Syariah law dictates that the rights of a Muslim blood relative supersede those of a non-Muslim non-blood relative. (If examined closely, this also means that Syariah law places at a higher level the *rights* of living Muslim blood relatives than even the *wishes* of the deceased Muslim whose estate distribution is in question. It is important to understand this KEY difference between secular and Syariah law codes.)

The case study makes it clear that Norliah's religious (Muslim) father disapproves of Norliah's choice of friends. It isn't surprising then that he disputes Norliah's Will. **As such, Norliah's wishes will not be adhered to, and Melanie will not get the car.**

SAMPLE ANSWER TO Q5b.

5b. As mentioned above, under Syariah law, only up to one-third of a deceased Muslim's estate may be distributed through a Will.

However, there are unique circumstances when that specified one-third ceiling might be raised. Those circumstances generally revolve around the unanimous consent of all other heirs who stand to benefit from the generally larger residual portion under FARAIID.

What this means is that despite Norliah's wish to exclude her relatives from inheriting her assets, **she cannot do so under Syariah law**. Even if her Will were to specifically allocate 100% of all her assets to her closest, dearest friends, Syariah law would take precedence and at least two-thirds of her assets would be distributed to various relations. Although the law does provide for the possibility of the Syariah beneficiaries unanimously allowing asset distribution to go to Norliah's stipulated heirs, her father's rigid position seems to preclude that happening. (The only ways Norliah can work around the strict Syariah code is to give gifts to her friends while she is still alive or to place certain assets in a trust in favour of those Syariah-excluded individuals.)

### SAMPLE ANSWER TO Q5c.

5c. The 12 relatives entitled to Syariah distribution of the remainder of a Muslim's estate that is not distributed under a legally established, uncontested Will are:

1. Husband;
2. Wife;
3. Father;
4. Grandfather;
5. Mother;
6. Grandmother;
7. Daughter;
8. Son's daughter;
9. Full sister;
10. Half sister by the same father;
11. Half brother by the same mother; and
12. Half sister by the same mother.

According to Syariah law experts, these 12 'types' of relatives give rise to a total of 25 conceivable categories of relations – 15 possible categories of male heirs and 10 categories of female heirs.

The entire issue of preferential treatment arises if all, or enough to cause distribution problems, of the 25 conceivable categories of relations are alive. Then, one simple guiding principle helps clear matters: **More distant degrees of relationship are excluded by closer degrees of relationship.**

When it comes to male heirs there are 15 possible relationship categories:

1. Son;
2. Grandson;
3. Father;
4. Paternal grandfather;
5. Full brother;
6. Half brother by the same father;
7. Half brother by the same mother;
8. Son of a full brother;
9. Son of a half brother by the same father;
10. Full paternal uncle;
11. Half paternal uncle;
12. Son of a full paternal uncle;
13. Son of a half paternal uncle;
14. Widower (husband of the deceased);
15. Male slave overseer.

Of these 15 male relationship categories, the three closest ones are the father, son and husband of the deceased. If the deceased, therefore, were a married woman, with a living father and son, none of the other 12 relationship categories would be entitled to inherit anything under the exclusion rules that govern FARAID.

For instance, the paternal grandfather is excluded because of the closer relationship of his son, the deceased's father.

Moving on, these 10 possible female relationship categories might qualify as heiresses:

1. Daughter;
2. Daughter of a son (granddaughter through the son);
3. Mother;
4. Paternal grandmother;
5. Maternal grandmother;
6. Full sister;
7. Half sister by the same father;
8. Half sister by the same mother;
9. Widow or widows (wife or wives of the deceased);
10. Female slave overseer.

Of these 10 female relationship categories, the five closest ones are the daughter, granddaughter through the son, mother, wife and daughters of the same father. If the deceased, therefore, were a married man, with a living mother, daughter, granddaughter through at least one son and half-sisters by the same father, then none of the other five, more distant, relationship categories would be entitled to inherit anything under the exclusion rules that govern FARAID.

For instance, the maternal grandmother is excluded because of the closer relationship of her daughter, the deceased's mother.

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**THE END**