## South Tuen Mun Government Secondary School Basic of Personal Financial management WS#4 Application Problems\_a

1.29) a) Assume that interest is compounded annually and your grandmother will withdraw all the money after one year. Calculate the amounts that she will get in one year		
from the three banks, respectively.	(6 marks)	

b) Calculate the amounts that your grandmother will get one year from Bank A and Bank B, respectively. (4 marks)		
c) Based on the information in part (b), which of the three banks should your grandmother choose? (1 mark)		

1.32) a) Calculate the net present values (NPV) of investment plan 1 and 2.	
b) If Mr Cheng only has \$40,000 to invest, which investment plan should he choose?	
c) If Mr Cheng has \$70,000 to invest, should he invest in both investment plans 1 and 2? Explain.	

1.33) a) How much does Tom have to deposit now so that he will have sufficient funds to pay for Nancy's tuition fees in her first year of college? (5 marks)		
pay for Maricy's tuttion fees in her first year of conege: (5 marks)		
b) One year after Tom deposits the money, the bank lowers its annual interest rate to How much more money does Tom have to deposit in order to have enough money for I tuition fees in two years?		

**1.29 a** Bank A: 
$$$50,000 \times (1 + 5\%) = $52,500$$
 (2 marks)

Bank B: 
$$$50,000 \times (1 + 6\%) = $53,000$$
 (2 marks)

Bank C: 
$$$50,000 \times (1 + 6.5\%) = $53,250$$
 (2 marks)

**b** Bank A: \$50,000 × 
$$\left(1 + \frac{5.5\%}{4}\right)^4$$
 = \$52,807.2 (2 marks)

Bank B: \$50,000 × 
$$\left(1 + \frac{6\%}{2}\right)^2$$
 = \$53,045 (2 marks)

- c Since my grandmother can get the largest amount of money from Bank C in one year, she should choose Bank C. (1 mark)
- **1.32** a The total PV of annual cash inflows

= 
$$\$20,000 \div (1 + 10\%) + \$20,000 \div (1 + 10\%)^2$$
 (2 marks)  
=  $\$34,710.74$ 

PV of Speedy's market value at the end of Year 2

$$= $15,000 \div (1 + 10\%)^2$$
 (1 mark)

= \$12,396.69

Total PV = \$34,710.74 + \$12,396.69 = \$47,107.43

$$NPV = $47,107.43 - $50,000 = -$2,892.6$$
 (2 marks)

Since the NPV is negative, Mavis should not buy the computer system. (1 mark)

b New NPV = 
$$$47,107.43 - $45,000 = $2,107.4$$
 (2 marks)  
Since the NPV is positive, the financial benefit of buying the system outweighs its cost. Mavis should buy the system. (1 mark)

c The total PV of annual cash inflows

= 
$$$25,000 \div (1 + 10\%) + $25,000 \div (1 + 10\%)^2 + $25,000 \div (1 + 10\%)^3$$
 (2 marks)  
=  $$62,171.30$ 

PV of Excellent's market value at the end of Year 3

$$= $20,000 \div (1 + 10\%)^{3}$$

$$= $15,026.30$$
(1 mark)

Total PV = 
$$$62,171.30 + $15,026.30 = $77,197.6$$
  
NPV =  $$77,197.6 - $80,000 = -$2,802.4$  (2 marks)

**d** Since the NPV of Speedy (\$2,107.4) is positive and is higher than that of Excellent (-\$2,802.4), Mavis should buy Speedy.

**1.33 a** The total tuition fees after three years:

$$FV = $150,000 \times (1 + 5\%)^3$$
 (1 mark)  
= \$173,643.75 (1 mark)

The amount of money that Tom has to deposit now:

$$PV = \frac{\$173,643.75}{(1+9\%)^3}$$
 (2 marks)  
= \\$134,084.8

Therefore, Tom has to deposit \$134,084.8 now so that he will have sufficient funds to pay for Nancy's tuition fees in her first college year.

**b** The amount of Tom's deposit in one year:

$$FV = $134,084.8 \times (1 + 9\%)$$
 (1 mark)  
= \$146,152.43

One year after Tom deposits the money, the amount of money required in order to have enough money for Nancy's tuition fees

$$= \frac{\$173,643.75}{(1+8\%)^2}$$
 (2 marks)

= \$148,871.53

Extra amount of money that Tom has to deposit